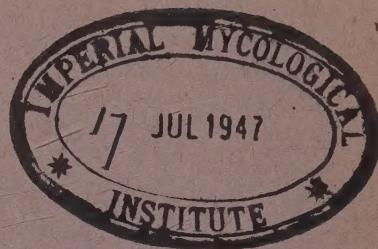


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## Errata.

- V.B.* 17, p. 77, abst. 332, penultimate line. For "[See also *V.B.* 16. 112—" read "[See also *V.B.* 17. 112—".  
 p. 112, abst. 503, lines 8 & 9. For "[*V.B.* 16. 77]" read "[*V.B.* 17. 77]".

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

## Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

## REVIEW ARTICLES

- (1) "The Present Position of Phenothiazine as an Anthelmintic".
- (2) "Trichomoniasis—A Review of Recent Literature".

Reprints (price 1/6 and 2/6 respectively) obtainable from: Central Sales Branch (Imperial Agricultural Bureaux), Penglais, Aberystwyth.

THE  
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[No. 6.]

## DISEASES CAUSED BY BACTERIA AND FUNGI

ROWLANDS, W. T., & SMITH, H. W. (1945.)  
**Staphylococcosis in geese.**—*J. comp. Path.*  
55. 125-131. 1098

Although this condition has been recognized in geese on the Continent for many years, it is here recorded for the first time in Great Britain, in four widely separated outbreaks in North Wales.

The condition is typically an arthritis, with abscesses in the joint capsules, tendon sheaths and peri-articular tissue. Small black scabs on the under surface of the web appear to be the initial lesions. The characters of the staphylococcus isolated are described.

Agglutination tests were carried out using two strains of the goose organism and one strain of staphylococci from a case of bovine mastitis. The bovine antigen was not agglutinated beyond 1:10 by any of the goose sera tested. Bovine sera did not agglutinate either the goose antigen or the bovine antigen. Both the goose antigens were agglutinated to equal titre, never less than 1:160, by the sera of affected geese. Sera from geese in the affected flocks which had no symptoms had titres of from less than 1:10 to 1:80, the majority being 1:10 or 1:20. Sera from geese on disease-free farms rarely agglutinated to more than 1:10.

An autogenous vaccine was of no value either as a therapeutic or as a prophylactic agent. Sulphadiazine was not bacteriostatic, but penicillin was definitely bacteriostatic to the staphylococcus *in vitro*.

The source of the infection is discussed and evidence is produced which tends to show that the staphylococcus may be the cause of the condition.—A. FOGGIE.

SCHUMANN, P. (1944.) Erfahrungen bei der Bekämpfung des gelben Galtes der Kühe. [Experience in controlling bovine streptococcal mastitis.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 42-44. 1099

S. gives the results of a mastitis control campaign in Lower Silesia, based on accurate

bacteriological diagnosis, hygienic measures and either chemotherapy by entozon [a mixture of rivanol (2, ethoxy-6, 9, diamino-acridine lactate) and a nitro-acridine derivative] infusions, or, in absence of this, careful frequent milking and stripping of affected quarters. The results in six herds are tabulated. They were poor, with a minority of cures in entozon-treated cows and a final degree of infection nearly as great as at the beginning.—J. E.

STEIN, C. D., & ROGERS, H. (1945.) **Observations on the resistance of anthrax spores to heat.**—*Vet. Med.* 40. 406-410. 1100

Spores from 31 strains of anthrax bacilli were destroyed in 5-15 min. at 100-101°C. in the steam sterilizer, but at 90°-91°C. spores from only six out of the 12 strains were destroyed in 60 min. In the autoclave, at 120°C., all of the 31 strains tested were destroyed in 5-15 min. Vigorous boiling killed 43 strains within 3-5 min. Dry heat at 149°-150°C. destroyed dry spores of 30 strains in 60 min. while dry spores from 12 strains resisted the same temperature for 30 min.

—M. L. LEVI.

VERGE, J., & SENTHILLE, F. (1942.) Nouvelles acquisitions sur l'étiologie de la tuberculose des équidés. [TB. in the horse.]—*Bull. Acad. vét. Fr.* 15. 229-231. 1101

Three strains of *M. tuberculosis* have been isolated by the authors from horses. Two were of the bovine and one was of the human type. The comparative rarity of TB. in horses in France as compared with England is noted.

Records from the literature of 112 strains from horses which have been typed are listed in a table. Of these, 80.3% were bovine type, 9.8% human type and 8.9% avian type.—M. C.

BEAMER, P. D. (1946.) **Leucocytic changes in the bovine animal eighteen hours after subcutaneous injection of tuberculin.**—*J. Amer. vet. med. Ass.* 108. 429-431. 1102

B. reports the preliminary results of a study,

on 15 cattle from herds free of TB. and 84 cattle from infected herds, of changes in the white blood cell count following the subcutaneous injection of 5-30 ml. of tuberculin prepared by the Bureau of Animal Industry, U.S.A.

The blood of 24 out of 25 cows that were reactors to tuberculin had an altered leucocytic formula 18 hours after the injection of the tuberculin; there was, however, a similar reaction in 14 non-reactors: in the case of six of them, *Corynebact. pyogenes* infection was found P.M.—W. R. K.

FELDMAN, W. H., & HINSHAW, H. C. (1946.)

**Tubercle endotoxoid (Grasset) in experimental tuberculosis in guinea pigs.**—*Amer. Rev. Tuberc.* 54. 183-188. [Spanish summary.] [English summary and conclusions copied *verbatim*.] 1103

Using tubercle endotoxoid furnished by Grasset, experiments were done to determine the effect of this substance on the course of experimental tuberculosis in guinea pigs. Four groups of 16 guinea pigs each were utilized. All were inoculated subcutaneously with 0.001 mg. of a human strain of tubercle bacilli (H37Rv). One group was untreated and served for controls. One group was treated twice weekly for 182 days with tubercle endotoxoid only; another group received promin orally for a like number of days and the fourth group received both promin and tubercle endotoxoid. The animals had been infected for twenty-four days before treatment was started.

The data obtained provide evidence in support of the following conclusions:

1. Tubercle endotoxoid failed to reveal any deterrent or therapeutic effects on tuberculosis previously established in guinea pigs.

2. Concurrent treatment with promin of another group of experimentally infected guinea pigs resulted in definite suppression of the disease.

3. Slightly more effective therapeutic results were observed in a group of experimentally infected tuberculous guinea pigs that received both promin and tubercle endotoxoid than were obtained in the group which received promin alone.

BERGSTRÖM, S., THEORELL, H., & DAVIDE, H.

(1946.) **Effect of some fatty acids on the oxygen uptake of *Mycobact. tubercul. hum.* in relation to their bactericidal action.**—*Nature, Lond.* 157. 306-307. 1104

A technique is described for measuring the effect of antibiotics on the respiration of large inocula of *M. tuberculosis*, utilizing a Warburg manometer and a shaking time of 18 hours. The method should prove useful for the rapid evaluation of antibiotics. Various normally occurring unsaturated fatty acids were shown to inhibit

oxygen consumption to a greater extent than the most active saturated acids so far synthesized.

—ALEX. B. PATERSON.

BUU-HOI, N. P. (1945.) **Fatty constituents of tubercle bacilli as growth-inhibitors of the same bacilli.**—*Nature, Lond.* 156. 392. 1105

A mixture of fatty acids extracted from *M. tuberculosis* and freed of fractions of very high molecular weight and waxy alcoholic acids was converted *via* the acid chlorides and amides to the corresponding amines. The latter proved highly bacteriostatic to tubercle bacilli on synthetic media at dilution of 1:10,000, resembling to some extent the synthetic higher fatty acid amides. This production of an inhibitor by modifying a radical while retaining the original molecular structure is of importance when considering the relationship between chemical and immunological methods of therapy.—ALEX. B. PATERSON.

MICHAEL, D. T. (1946.) **Some clinical observations on Johne's disease of sheep.**—*Vet. Rec.* 58. 297-298. 1106

M. presents certain theories reached as a result of clinical observation, testing with P.P.D. Johnin and microscopic examination of faeces of infected flocks in Wales.

Well marked reactions were obtained on testing with P.P.D. Johnin intradermally in the caudal fold. In some flocks as many as 33% of the sheep reacted positively, but since early and advanced cases may not react, diagnosis on clinical symptoms is to be preferred. In infected flocks it is claimed that anthelmintic treatment of lambs after weaning markedly reduces losses from Johne's disease 18 months later. Improvement of the level of nutrition in early cases may increase the body weight by 50-80%. M. considers that the evidence suggests that sheep affected with "pinning", as a result of a cobalt deficient diet, are especially susceptible to Johne's disease. Treatment of 250 cases [method of diagnosis not stated] with 1 grain of cobalt sulphate in 10 ml. water at 6-10 day intervals until at least four doses had been given is stated to have been followed by marked clinical improvement, noticeable in 2-4 days.

M. considers that the incidence in hill flocks is influenced by the breed of the sheep: in cross-bred lambs sired by rams of the heavier breeds the course of the disease is rapid. A long-term policy of control is recommended, aiming at adjusting the flock type to the environment by judicious selection of stud rams.—G. B. S. HEATH.

ALBRECHT, B., & NAGEL, E. (1943.) **Zur Kultur des Bact. paratuberculosis auf Hohns Substrat 4. [Cultivation of *M. johnei* on Hohn's medium 4.]**—*Zbl. Bakt. I. (Orig.)* 150. 53-55. 1107

In experiments with the laboratory strain "Oslo" of *M. johnei* it was shown that Hohn's "substrate 4" medium supported its growth well. Extracts of human and bovine type tubercle bacilli reported by other authors to support the growth of the organism in question failed to do so here, while a dilution of "substrate 4" with physiological saline was superior to "substrate 4" only.—E. KLIENEGER-NOBEL.

KRAGE, P. (1944.) Druse-Diphtherie bei Fohlen in Ostpreussen. [Strangles diphtheria in foals in East Prussia.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 49-50. 1108

After a brief discussion of the evidence for and against the existence of a filtrable virus causing strangles, K. describes the common occurrence in horses in East Prussia of genuine diphtheria bacteria as secondary invaders in strangles. This results in a malignant form of the disease with emaciation and delayed healing of abscesses: the abscess pus has a faecal odour. The diphtheria bacteria are not very easy to isolate [no details given]. Diphtheria antitoxin is a valuable aid to recovery from the dual infection in horses. Preventive vaccination has also given good results.—J. E.

LESBOUYRIES, G. (1942.) Infection du lapin par *Corynebacterium metritis*. [Corynebacterium infection in rabbits.]—*Bull. Acad. vét. Fr.* 15. 338-344. 1109

L. studied a disease which occurred in a rabbitry near Paris in 1941. Only females were affected. The chief symptoms were fever, loss of condition, unsteady gait, partial paralysis of the hind limbs, congestion of the vulva and a mucopurulent vaginal discharge. Abortion frequently occurred. Lesions consisted of irregular enlargement of the uterus, petechial haemorrhages on the mucous membrane of the vagina and vulva, enlargement of the abdominal lymph nodes with abscess formation and multiple small areas of necrosis in the liver. 75% of the affected rabbits died or were destroyed *in extremis*.

A diphtheroid organism was isolated and its characters are described. L. considers that it is identical with the *Corynebact. metritis* described by SOUKHINE (1934).—M. C.

DENIZOT. (1944.) Localisations infectieuses aiguës des séreuses de porcelets dues au rouget. [Acute inflammatory lesions of the serous membranes in piglets due to swine erysipelas.]—*Rec. Méd. vét.* 120. 67-69. 1110

Clinical descriptions are given of cases of acute arthritis in young pigs. In some of these, a sero-fibrinous exudate was found in the serous cavities at autopsy. In one case, there was a lesion of chronic endocarditis due to *E. rhusio-*

*pathiae*. Treatment of cases with these acute lesions of the joints and serous membranes with *E. rhusiopathiae* antiserum was followed by rapid recovery, and it is suggested that these cases were in fact forms of swine erysipelas.—E. COTCHIN.

LARSON, C. L. (1945.) Immunization of white rats against infections with *Pasteurella tularensis*.—*Publ. Hlth Rep., Wash.* 60. 725-734. 1111

White rats were used as test animals in studying immunity to tularaemia. Vaccines prepared from yolk-sacs of infected chick embryos were effective. Their antigenic value was enhanced by preliminary ether extraction. The aqueous layer contains bacterial bodies, and a soluble antigen which induces marked resistance to infection and can also be used in the complement fixation test.—M. L. LEVI.

GAUGER, H. C., & GREAVES, R. E. (1946.) Isolations of *Salmonella typhimurium* from drinking water in an infected environment.—*Poult. Sci.* 25. 476-478. 1112

Twelve turkey hens were artificially infected *per os* with *S. typhi-murium* and 41 days after infection cultures were made twice weekly from the top 2 in. and from the bottom 2 in. of drinking water remaining in a 12 quart galvanized bucket at the end of approximately 24 hours. The bucket was scrubbed, rinsed several times and filled with fresh water daily. *S. typhi-murium* was isolated 13 times out of the first 14 tests. Thereafter the bucket was also scalded daily and in the next five weeks to the end of the experiment *S. typhi-murium* was not recovered.

The investigation was carried out from August to October and the authors consider that the water became contaminated with the small quantities of mash washed off the birds' backs and that *S. typhi-murium* multiplied in the water during warm weather. They infer that the container probably became infected with the organism soon after the turkeys were originally infected and that the infection persisted in spite of daily mechanical cleaning until scalding effectively removed the salmonella.—D. LUKE.

SCHÜTZLER, G., BARTEL, H., & MATTHIAS, D. (1943.) Untersuchungen an Pferden mit inneren Krankheiten und Enteritisbakterienbefall. [The examination of horses with internal diseases and salmonella infections.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 81-90. 1113

It has been observed that many horses affected with diverse internal diseases die instead of recovering as expected. In an effort to explain this, bacteriological investigation on the faeces, urine and blood of living horses and on the organs of dead horses was carried out, with the result

that *S. newport* was isolated in 16 cases and *S. breslau* in three, one case having both organisms, the former in the digestive tract and the latter in the blood.

The primary diseases complicated by *Salmonella* infection included obstructive colic, principally of the caecum, purpura, strangles, infectious bronchitis (Brussels' disease) and pneumonia. Three-quarters of the cases ended fatally. The chief clinical signs of the flare-up of secondary infection were fever, frequent pulse, great thirst and diarrhoea. The usual finding P.M. was catarrhal gastro-enteritis combined with profuse mucus formation. The liver, kidneys and heart had parenchymatous degeneration and the lungs and spleen were congested.—J. E.

BIER, O., & LACERDA JOR., P. (1943.) **Studies on the immunogenic relationship in the salmonella group. I. Protection tests with Felix's anti-typhoid serum.**—*Rev. brasil. Biol.* 3. 391-394. [In English: Portuguese summary.] 1114

Using mice, the authors tested the protective action against eight different species of *Salmonella* of a potent commercial O and Vi typhoid antiserum derived from horses. A marked degree of passive protection was afforded not only against typhoid bacilli but also against *S. typhi-murium*, *S. gallinarum*, *S. paratyphi B* and *S. sendai*. As all these species possess the XII antigen, it is suggested that this may be responsible for the hetero-immunity, although *S. paratyphi A*, which also possesses the XII antigen, was not neutralized by typhoid antiserum.—D. LUKE.

LERCHE, M., & BARTEL, H. (1943.) **Fünf Jahre Typendifferenzierung. [Five years of type differentiation of salmonella bacteria.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 41-49. 1115

In the course of five years, 7,674 *Salmonella* strains were typed. During this time both increase and decrease of certain types was noticed. *Salmonella* organisms, particularly those of the *S. dublin* type, were more frequent in cattle than in any other animals. *S. dublin* also occurred in pigs, sheep and horses. *S. breslau* was frequently found in cattle. The geographical and the annual distribution of various types was worked out. The main pathological conditions caused by the various types were investigated.

These systematic investigations show that the so-called new types of *Salmonella* organisms are relatively rare in livestock. Only a small percentage of those causing human infections are also found in animals. It is therefore incorrect to assume that *Salmonella* infections in human beings are mostly derived from animals.

—E. KLIENEBERGER-NOBEL.

JENKINS, C. E. (1946.) **A study of the prozones of the salmonella.**—*Brit. J. exp. Path.* 27. 127-134. 1116

J. discusses the prozone phenomenon in bacterial agglutination. He found that purified flagellar antigens produced a prozone more readily than did the corresponding H antigen. No prozonal lag was found with released antibody. Pyridine removed the flagellar antigen from salmonella, but left the somatic antigen in its compound state; the second component, however, was so altered that prozones were readily produced. The pyridine somatic antigens were mainly species-specific. It is claimed that the study of prozones can assist in the investigation of antigenic structure. Dioxan [diethylene dioxide] though removing the flagellar antigen, did not alter the somatic complex to produce prozones.—D. LUKE.

RUBINO, M. C., SZYFRES, B., & TORTORELLA, A. (1944.) **Epizootologia de la brucelosis en el Uruguay. [Epizootology of brucellosis in Uruguay.]**—*Num. cientif. accion Sind., Montevideo.* 7. 13-24. 1117

Contagious abortion was declared a notifiable disease in Uruguay in 1928, but no special steps were taken against it until 1942. Laboratory tests were not compulsory and were only asked for occasionally by owners who suspected the presence of the disease or by exporters who wanted a certificate of freedom. From 1932-34 these occasional tests, nearly 50,000 in all, gave a percentage of 9.4 positives, but a special survey of the farms supplying Montevideo with milk in 1932-33 revealed that more than half were infected, an incidence of 20.3%. In October, 1942, a law was made requiring all bovines and swine exhibited at shows, exposed for sale or slaughter or on farms and estates up for sale, to be submitted to a laboratory test. Nearly 30,000 such tests were made, indicating an incidence of 3.8% in cattle. This law is widely evaded.

*Br. suis* is common in swine imported from the Argentine, but was not found in Uruguay until 1943, when a sow imported from the Argentine and negative to the test, aborted; within a few months 12 sows aborted on the same farm. Tests revealed 42 positive and 13 doubtful reactions. Two more centres of infection were found in 1944 and both farms were slaughtered out.

No brucellosis has been found in goats, sheep or horses, though poll evil and fistulous withers are common in the latter. Poultry in contact with infected cows sometimes give positive reactions but so far the organism has not been isolated from them.—R. MACGREGOR.

KARSTEN. (1943.) **Über Virulenzprüfung von**

Brucellastämmen. [Virulence tests of *Brucella* strains.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 359-360. 1118

In order to determine the virulence of a strain of *Br. abortus* a test in mice is recommended. If 250-500 × 10<sup>9</sup> organisms injected intraperitoneally kill the mice, the strain is fully virulent. Should the mice survive, the condition of their organs gives further information about the degree of virulence. Newly isolated *Brucella* organisms so tested proved to be virulent. Strains that had been kept on artificial media for ten years and more had diminished virulence.—E. K-N.

KERNKAMP, H. C. H., ROEPKE, M. H., & JASPER, D. E. (1946.) Orchitis in swine due to *Brucella* Suis.—*J. Amer. vet. med. Ass.* 108. 215-221. 1119

Orchitis is considered an important clinical expression of brucellosis in boars. The incidence of testicular infection was studied when symptoms were observed in two boars in a herd in which a number of boars were bred for sale. Agglutination tests revealed widespread infection in the herd. Of 19 males tested and castrated, it was found from the results of inoculation tests into laboratory animals that all were infected. 14 proved positive biologically and all were positive either to this test or to the aggl. test. Clinical observations and the histology and appearance of the testicles are described.—S. J. GILBERT.

VELU, H., & SOULIÉ, P. (1942.) *Proteus vulgaris* interviendrait-il dans les pododermatites végétales et les crevasses? [*Proteus vulgaris* a cause of pododermatitis and hoof canker in horses.]—*Bull. Acad. vét. Fr.* 15. 177-180. 1120

The authors isolated *P. vulgaris* on a number of occasions from suppurating lesions in horses, especially lesions of the limbs and feet. They describe the cultural characteristics of eight strains. Agglutinins have been demonstrated in the blood of horses with such suppurating lesions in titres up to 1:200. In the blood of apparently healthy horses, agglutinins were either absent or present in low dilutions.

It is suggested the *P. vulgaris* may be of greater pathogenic importance in veterinary medicine than has been thought in the past.

—M. C.

RAMON, G., & LEMÉTAYER, E. (1942.) Quinze années de prophylaxie du tétanos chez les animaux domestiques et en particulier chez le cheval au moyen de la vaccination par l'anatoxine tétanique. Résultats. [Tetanus prophylaxis in domestic animals.]—*Bull. Acad. vét. Fr.* 15. 48-49. 1121

The results of active immunization by ana-

toxin of horses and other domestic animals during a period of 15 years, both in the army and in civilian stock, are reviewed. It is concluded that active immunization has given excellent results and should supersede passive immunization with serum. Two injections of anatoxin at an interval of one month are given.

Immunity is considerably increased by a third "reinforcing" dose given after a period [length not stated]. Immunity is claimed to be solid and lasting.—M. C.

BRION, A., & ARMINGAUD, F. (1945.) Le botulisme du cheval. Relation d'une nouvelle enzootie. [Botulism in the horse.]—*Rev. Méd. vét., Lyon et Toulouse.* 96. 17-32 & 60-69. 1122

This is a general review including a report of an outbreak on a farm in which six mares were affected, five dying rapidly, 12-74 hours after the first symptoms. The farm was heavily infested with rats and the putrefying carcass of a hare was discovered in the field where the animals were grazing. Laboratory examination of material at autopsy failed to reveal the presence of *Clostridium botulinum* or its toxin. The authors believe, however, that the history, the symptoms and the lesions justify their diagnosis of botulism.

—M. L. LEVI.

GREISEN, E. C., & GUNSALUS, I. C. (1944.) An alcohol oxidation system in streptococci which functions without hydrogen peroxide accumulation.—*J. Bact.* 48. 515-525. 1123

In the presence of air and without added hydrogen carriers, *Str. agalactiae* oxidized ethyl alcohol into aldehyde and acetic acid. Hydrogen peroxide did not accumulate. The effect of various enzyme inhibitors was studied. In the absence of oxygen the aldehyde was dismutated into acid and alcohol.—M. L. LEVI.

KNIGHT, B. C. J. G. (1945.) La formation des toxines par les bactéries. [The production of toxins by bacteria.]—*Bull. Inst. Pasteur.* 43. 257-267. 1124

Attention is directed to the recent methods of enhancing toxin production by various organisms and to the difficulty of applying these modifications to large scale manufacture.

The basis of modern studies is the fundamental nutritional requirements of the organisms. It is now possible to grow *C. diphtheriae*, *Cl. tetani* and *Cl. septicum* on simple media of known composition containing the appropriate amino-acids, glucides, inorganic salts and certain accessory growth factors. *C. diphtherae* requires pantothenic acid, biotin and nicotinic acid; *Cl. septicum* needs thiamine, pyridoxine, nicotinic acid and biotin; *Cl. tetani* is more exacting, requiring

in addition to the above, riboflavin, folic acid, adenine, uracil and oleic acid.

The toxins themselves are protein products, probably arising from synthesizing processes in the bacteria themselves and not degradation products of the medium. Some have the properties of enzymes, e.g., lecithinase elaborated by *Cl. welchii*. The types of enzymes produced are reviewed in some detail. K. considers that an exact study of the biology and biochemistry of toxin production demands the elaboration of methods permitting a constant control of the composition of the media, including pH values, during the whole period of growth. It is now known that the concentration of iron in the medium has a profound influence on toxin production. The optimum, 0.14 mg. per litre, is far below that necessary to ensure the maximum growth and the hypothesis has been advanced that the increased formation of toxin represents a compensatory reaction of the bacterium to conditions unfavourable for growth. The amount of iron and of other metals required by different toxigenic organisms may be of great importance in determining the best conditions for toxin production.

The selection of suitable strains is considered with special reference to *C. diphtheriae* No. 8 (Park Williams). It is suggested that further study may reveal that the separation of toxigenic from non-toxicogenic colonies may be effected by differential media. It is of interest that *Cl. septicum*

can be dissociated into smooth toxigenic and rough non-toxicogenic variants.—R. E. GLOVER.

SEVERENS, J. M., & TANNER, F. W. (1945.) **The inheritance of environmentally induced characters in bacteria.**—*J. Bact.* 49. 383-393. 1125

Single cell cultures of *S. pullorum*, *S. typhi* and *S. schotmülleri* were able to adapt themselves to concentrations of NaCl, HgCl<sub>2</sub> and CuSO<sub>4</sub> considerably higher (6-8%) than those required to inhibit growth of non-adapted strains (3%). The resistant strains were specific in their chemoresistant power and were inhibited by heterologous chemicals. A change in hereditary constitution is the probable explanation, since single cell cultures of resistant strains retained their resistance for long periods through numerous subcultures. The hereditary nature of the changes and their specificity suggest that they are mutations: further experiments showing that chemoresistance occurred in a few individuals in non-adapted bacterial populations support to this view.

—ALEX. B. PATERSON.

EDWARDS, P. R. (1946.) **The segregation of antigens in a bacterial culture by an undescribed form of variation.**—*J. Bact.* 51. 523-529. 1126

*Salmonella hormaechei* (XXIX [Vi]: z<sub>30</sub>, z<sub>31</sub>) dissociated into two apparently stable variants of the formulas XXIX [Vi]: z<sub>30</sub> . . . and XXIX [Vi]: z<sub>31</sub> . . . This variation may have a bearing on the origin of *Salmonella* types.—M. L. LEVI.

See also absts. 1138 (*Haemophilus* infection), 1205 (chemotherapy), 1210 (swine erysipelas), 1211 (*Pseudomonas pyocyanea*), 1210, 1212-1216 (antibiotics), 1217, 1218 (avian salmonellosis), 1234 (spirillum fever), 1238 (TB.), 1245 (fungus-infected fodder), 1247, 1249 (salmonella in meat), 1255, 1256 (streptococci, caseous lymphadenitis, brucellosis, TB., clostridial infections).

## DISEASES CAUSED BY PROTOZOAN PARASITES

NEVEU-LEMAIRE, M. (1943.) *Traité de protozoologie médicale et vétérinaire. [Treatise on medical and veterinary protozoology.]* pp. xix + 844. Paris: Vigot Frères. 8vo. £2 17s. 6d. 1127

The first part of this book deals with general considerations of protozoology—history, parasitism and adaptation to parasitic existence, specificity, methods of multiplication and migration to new hosts, host reactions, parasites of protozoa and the methods of study and of culture of the various types of organisms. Nothing is given in this section which is not contained in other books on protozoology, except the parasites of protozoa; amongst these it is noted that bacteria have been recorded in *Paramoecium caudatum*, moulds in some of the amoebae and trichomonads, protozoa in *Lankesteriae ascidia* and a nematode in the cytoplasm of a ciliate.

The second part of the book, after a general account of protozoan structure, deals systematic-

ally with the various organisms, for the more important of which information is given as to their morphology, their definitive, reservoir and intermediate hosts, biology, transmissibility to experimental animals, culture, geographic distribution, symptomatology and pathology in infected hosts, chemotherapy and methods of control. [As the book was published in 1942 the chemotherapy notes are already largely out of date.] Descriptions are included of the rickettsia and spirochaetes and some other unclassified organisms which are not usually accepted as protozoa.

In the genus *Amoeba*, ten species are named which have been recovered from the faeces of man and animals and one species is noted as responsible for causing cancerous growths on the nostrils and lips of sheep.

In the genus *Entamoeba*, *E. coli*, *E. gingivalis* and *E. dysenteriae* [= *E. histolytica*] are described, and 13 species occurring in domestic stock and poultry are named. Names are mentioned of an

*Endolimax* from fowls, an *Iodamoeba* from swine, a *Sappinia* from cattle and man and a *Chlamydo-phrys* from equines and swine.

Amongst the Trypanosomidae brief descriptions are given of the leptomonas, crithidia and herpetomonas parasites of biting insects and ticks, a description is given of human and canine leishmaniasis and attention is drawn to leishmanial infections recorded in goats and equines. *Trypanosoma lewisi*, *T. melophagium*, *T. theileri*, *T. nabiasi* of rabbits, *T. evansi*, *T. equiperdum*, *T. vivax*, *T. congolense*, *T. brucei*, *T. gambiense* and *T. rhodesiense* are described in detail and the diseases which they produce are discussed. *T. viennei* [in S. America *T. vivax*] is given as a separate species, but *T. uniforme* and *T. caprae* are disposed of as synonyms of *T. vivax*, whilst *T. simiae* is considered a synonym of *T. congolense*, and *T. equinum* a synonym of *T. evansi*. Brief descriptions are given of the trypanosomes of birds under the names *T. hannaï*, *T. numidae*, *T. calmetti* and *T. gallinarum*; whilst *T. cruzi* is described in detail but placed in the separate genus *Schizotrypanum*.

Amongst the monozoic flagellates with more than one flagellum, *Histomonas meleagridis*, *Heteromita uncinata*, *Enteromonas hominis*, *Embadomonas intestinalis*, *Embadomonas ruminantium*, *Cercomonas longicauda*, *Tricercomonas intestinalis*, and *Chilomastix davainei* are described, and brief reference is made to 17 other species from domestic stock or poultry, although no pathogenicity is ascribed to them.

Little pathogenicity is ascribed to the Trichomonadidae except for *Trichomonas foetus* and *T. columbae* [= *T. gallinarum*]; but these organisms are not fully described. The names of 14 other species of trichomonads of domestic stock are given, with, in some cases, some account of their morphology.

Amongst the diplozoic flagellates the genera *Octomitus*, *Giardia* and *Trepomonas* are considered, seven species of *Giardia* being named from domestic stock. [There seems to be no evidence that they are not all one species.]

After a description of microsporidia of insects, the genus *Encephalitozoon*, which is considered as belonging to that order, is discussed, but except for *E. rabiei* to which rabies has been ascribed, the only organism in animals is *E. cuniculi* of the rabbit. *Sarcosporidia* [= *Sarcocystis*] is also classed as a genus of sporozoa and 18 species are listed. [Some authorities doubt that sarcosporidia are protozoa, and the majority admit only one species which is not considered to be host-specific.] *Eimeria stiedae* and *E. perforans* (rabbit), *E. zurnii* (cattle), *E. avium* [= *E. tenella*] (fowl), *E. canis* (dog), *E. deblickei* (pig), *E. truncata*

(goose), and *E. solipedum* and *E. ungulata* (equines) are described, and four other species of *Eimeria* are listed without their distinguishing characteristics being given. [The oocyst of *E. avium*, with which *E. tenella* is said to be synonymous, is described as possessing a micropyle, and as varying in length from 10.5 $\mu$  to 38 $\mu$  and in breadth from 9 $\mu$  to 29 $\mu$ , but this does not agree with the classical description of *E. tenella*.] Four species of *Globidium* are described, infecting horses, cattle, sheep and camels, *Globidium* being accepted as a genus of the Eimeriinae. The organism in sheep is described under the name *G. faurei*, with *G. gilruthi*, *Eimeria intricata* and perhaps *E. arloingi* as synonyms. [There is some evidence that the oocysts described under the name *E. intricata* may be in fact the oocysts of *G. gilruthi*, but there is none to suggest that *E. faurei* and *E. arloingi* are identical with *E. intricata*.] Similarly *E. canadensis* is given as synonymous with *G. besnoiti* of the ox [but there is no evidence that the oocysts named *E. canadensis* are those of a *Globidium*]. *Isospora* spp. from dog, cat and man are described, but the name only is given in the case of the species of the pig.

The classical malarial parasites of man are fully dealt with, but *Plasmodium ovale* is regarded as an aberrant form of *P. vivax*. Only one malarial parasite in passerine birds is mentioned instead of the numerous species recognized by most authorities. It is given the name *P. praecox*, *P. relictum* being given as a synonym. No exoerythrocytic schizogony is mentioned as occurring in birds and in the case of *P. gallinaceum* this stage is described as accidental. *P. bubalis* of the buffalo is mentioned. Names are also given for species recorded from the dog, horse and goat. [The occurrence of malarial parasites in dogs rests on claims made by CASTELLANI & CHALMERS (1910, 1913, 1924) in Columbo. The parasites have not been found by other observers. *B. gibsoni* infection is common in dogs in Columbo and the ring forms of *B. gibsoni* resemble the ring forms of *Pl. vivax* quite closely. It is possible that the parasites seen in dogs by CASTELLANI & CHALMERS were *B. gibsoni*. Similarly they claim to have seen a plasmodium in a horse in Columbo. It has not been seen by any other observer since that date.]

*Leucocytozoon neavei* and *L. anatis* [= *L. simondi*] are described, and the names of six other species are given. Four of these species are said to occur in fowls, but no method is given of distinguishing them from one another.

The Piroplasmidae are divided by the author into the families Babesiidae and Theileridae, the Babesiidae being divided into the two genera *Babesia* and *Nuttallia*. Classical descriptions of the organisms are given, except that no information

is given as to the morphology of *B. major*. *B. bovis* infection is said to yield to treatment with trypan-blue, and *B. argentina* (syn. *B. berbera*) is said to cause a more severe disease than does *B. bigemina*. A newcomer to the textbooks is *B. perroncitoi*, a small piroplasm of pigs; the names but not the characters are given of organisms recorded in Russia, Angola and Annam.

Classical descriptions of the *Theileria* are followed, *T. dispar* being treated as synonymous with *T. annulata*. [The transmission of *T. parva* by inoculation of blood is not mentioned, nor is the diagnostic value of examining lymph node or spleen preparations.]

The sections dealing with haemogregarines and hepatozoa contain information on the occurrence of these parasites in cattle and dogs, and over a hundred pages are devoted to the ciliates, of which numerous species occur in the intestines of stock, but to which no pathogenicity has been ascribed.

Fifty pages are devoted to unicellular parasites whose nature is uncertain. In this section are included *Anaplasma* of cattle and sheep, *Grahamia* [= *Grahamella*] of cattle and fowls, *Bartonella* of man, cattle and dogs, *Aegyptianella* of fowls, *Eperythrozoon* of sheep, *Erythrocytozoon* of cattle and sheep, *Anachroma* of cattle, *Pirochroma* of cattle and sheep and *Sergentella* of man, of which some, it is admitted, may be vegetable organisms. *Toxoplasma* spp. are not fully dealt with and are mentioned under a variety of names depending on the vertebrate host. [Most authorities recognize that toxoplasms are not host-specific.]

The section on rickettsia, in addition to the information on the human infections, gives particulars of animal infections with *R. ruminantium*, *R. conjunctivae*, *R. blanci* (infection of horses in Greece), *R. canis*, *R. bovis* and *R. ovina*, and of infections of biting insects.

A final section deals with the spirochaetes which it is admitted belong to the vegetable kingdom. The pathogenic spirochaetes are divided into the two genera *Treponema* and *Leptospira*. Some 90 species of *Treponema* are mentioned, of which 13 occur in domestic animals or birds, the most important being *T. anserinum* of fowl spirochaetosis and *T. cuniculi* of venereal spirochaetosis of rabbits. Eleven species of *Leptospira* are mentioned, all being parasites of man; *L. canicola* is not mentioned although it causes disease in both man and dogs. [The involvement of animals in human rickettsial and leptospiral infections is not mentioned, except that the dog is given as an alternative host for *L. icterohaemorrhagiae* without any account being given of the disease in dogs.]

The third part of the book gives tables showing the species of parasites which the various hosts may harbour and intermediate and reservoir hosts of the various parasites.—U. F. RICHARDSON.

JONES, W. R. (1946.) **The experimental infection of rats with *Entamoeba histolytica*; with a method for evaluating the anti-amoebic properties of new compounds.**—*Ann. trop. Med. Parasit.* **40**. 130–140. 1128

J. suggests two reasons why previous workers have not found the rat a suitable animal for the investigation of experimental amoebiasis. He believes that mature rats are not suitable and that close observation of infected animals has not always been made during the acute phase of the infection. Cultures of *E. histolytica* injected rectally or intracaecally into three-month-old rats failed to infect them. Faecal material from an experimentally infected kitten produced amoebic infections in rats 3–4 weeks old. Degree of infection in groups of rats usually varied and it was found that the weight of the rat and the time after inoculation at which P.M. examination was made influenced the average degree of infection. Rats weighing 20–33 g. gave the best results and the infection was at its greatest after 3–6 days. A standard procedure is described for examining the therapeutic action of compounds against experimental amoebiasis in the rat.—C. H. S.

IKEJIANI, O. (1946.) **Studies in trypanosomiasis.**

I. The plasma proteins and sedimentation rates of erythrocytes of rats infected with pathogenic trypanosomes. II. The serum potassium levels of rats during infection with *Trypanosoma lewisi*, *Trypanosoma brucei*, and *Trypanosoma equiperdum*. III. The plasma, whole blood and erythrocyte potassium of rats during the course of infection with *Trypanosoma brucei* and *Trypanosoma equiperdum*. IV. The fragility of the erythrocytes in rats during the course of infection with *Trypanosoma lewisi*, *Trypanosoma brucei* and *Trypanosoma equiperdum*.—*J. Parasit.* **32**. 369–373, 374–378, 379–382 & 383–386. 1129

I. Rats infected with *T. brucei* or *T. equiperdum* had an increase in serum globulin, a decrease in serum albumin and an increased sedimentation rate. The change in serum proteins is considered to have been caused by damage to the kidney. The sedimentation rate was independent of the number of trypanosomes present in the circulating blood and was not related to the degree of alteration of the serum proteins: the factor responsible for the increased sedimentation rate seemed to reside in the red blood cells.

II. Rats infected with *T. brucei* and *T. equiperdum* developed anaemia and an increase in

serum potassium: these changes did not occur in infections with a non-pathogenic trypanosome (*T. lewisi*). The rise in serum potassium was closely related to the degree of anaemia and it is suggested that the red cells may have been the source of the excess of serum potassium. In the red cell counts of rats infected with *T. lewisi* and *T. equiperdum*, but not of those infected with *T. brucei*, there was a temporary rise before the anaemia developed.

III. Albino rats infected with *T. brucei* and *T. equiperdum* had an increased serum potassium, a decreased whole blood and erythrocyte potassium, and a decreased erythrocyte volume. Some of the increase in serum potassium was derived from altered permeability of the red cells and some from generalized tissue damage. The rise of serum potassium occurred only in the terminal stages of the infection and it is considered unlikely that this was the cause of death, but that it was merely a consequence of the moribund state.

IV. In rats infected with *T. brucei* and *T. equiperdum* there was an increased fragility of the red cells to hypertonic salt solutions. This change did not occur with infections with *T. lewisi*. The main cause of the increased red cell fragility was acidosis associated with the anaemia which develops early in trypanosome infection; the rise in serum potassium which occurs late in the infection may also have been a contributory factor. Since neither anaemia nor increased serum potassium occur in infections with *T. lewisi* an increased red cell fragility would not be expected in this infection.—E. G. WHITE.

COULSTON, F., CANTRELL, W., & HUFF, C. G. (1945.) **The distribution and localization of sporozoites and pre-erythrocytic stages in**

**infections with *Plasmodium gallinaceum*.—J. infect. Dis. 76. 226-238. 1130**

Biological evidence on the place of development of sporozoites in the avian host and the manner and rate of their dispersal from the point of inoculation are dealt with in this paper. The infectivity of the blood and organs of fowls bitten by *Aedes aegypti* infected with *P. gallinaceum* was tested by subinoculation into uninfected birds. The first "negative phase" of the blood lasted 36 hours, the only organ infected being the muscle at the site of the infective bites. The organs most usually infected 36-79 hours after infective bites were lung, spleen and heart, while brain, bone marrow and pancreas showed no infections during this period.

Tests on the infectivity of the blood and principal organs of fowls receiving intravenous inoculations of large numbers of sporozoites indicated that infections were produced during the first 36 hours by spleen, lung, kidney, liver, pancreas and muscle, but that the blood was infective only at the 36th hour and then became negative again until the 82nd hour. Brain and bone marrow became infective at the 70th hour, all other tissues becoming infective before this time. Suspensions of sporozoites of *Aedes* origin inoculated intravenously into chicks could be demonstrated in the blood for 5-20 min. by subinoculation and up to 15 min. microscopically, after which time they disappeared. It was not until 40 hours later that the infectivity of the blood reappeared.

Experiments on the rate of dispersal indicate that the route of passage is probably by way of the blood stream, but even if most of the sporozoites enter the blood stream not all of them leave the site of the mosquito bite.—C. HORTON SMITH.

See also absts. 1219 (penicillin), 1255, 1256 (*Anaplasma*).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

PARODI, A. S., PENNIMPEDE, F. C., & VILCHES, A. M. (1944.) **Reinstilación de líquidos y producción de anticuerpos contra influenza en el *Cricetus auratus*. [Inoculation of throat washings and production of influenza antibodies in the golden hamster.]—Rev. Inst. bact., B. Aires. 12. 317-319. 1131**

Pairs of golden hamsters were inoculated intranasally under ether anaesthesia with throat washings from each of 23 cases of influenza A virus infection. Three days later, one of each pair of hamsters was inoculated in an identical manner with an equal quantity of sterile physiological saline. Fourteen of the re-inoculated hamsters developed influenzal antibodies, while only seven of their partners developed antibodies.

(In only one case was the reaction negative in the reinoculated hamster and positive in its partner.) This method of re-inoculation with inert liquid is therefore recommended in the diagnosis of influenza, since it seems to augment the infectivity of the virus for the animal.—I. W. JENNINGS.

PARODI, A. S., LAJMANOVICH, S., & MITTELMAN, N. (1944.) **Adsorción del virus de la influenza por los núcleos de los glóbulos rojos de pollo. [Adsorption of influenza virus by the nuclei of chicken red blood cells.]—Rev. Inst. bact., B. Aires. 12. 312-316. 1132**

The nuclei of chick red cells, stripped of their covering of protoplasm, are capable of adsorbing influenza A virus. Once the nuclei

have adsorbed the virus and become saturated with it, they are incapable of adsorbing more. Although the substance responsible for the adsorption is present in large amount in the nuclei, it is probably present in a lesser degree in the cellular protoplasm, since non-nucleated red blood cells are capable of adsorbing virus.—I. W. JENNINGS.

CUNHA, R. (1943.) Verificação de anticorpos para o vírus "este" da encefalomyelose equina em sôro de cavalos no nordeste Brasileiro. [Antibodies neutralizing the virus of Eastern encephalomyelitis in the serum of horses in Minas Gerais.]—*Rev. brasil. Biol.* 3. 425-430. [English summary.] 1133

Previous records of outbreaks of E.E. in Brazil are reviewed and the investigations carried out in recent outbreaks in the North-Eastern districts are described. Recovery rate in some outbreaks was as high as 30% and sera from recovered animals mixed at various dilutions with brain suspensions from experimentally infected mice and inoculated intracerebrally or intraperitoneally into healthy mice, gave protection against a strain of "Eastern" virus, but not against a "Western" strain. These inoculations were controlled by similar injections of brain suspensions with dilutions of normal equine serum. It is confirmed that immune serum, when inoculated intraperitoneally with infected brain suspension, has a much greater protective titre than when inoculated intracerebrally.—U. F. R.

EBERBECK. (1943.) Erwiderung auf Ausführungen von Prof. Dr. Fortner in einer Aussprache über die infektiöse Anämie des Pferdes. Berl. und Münch. Tierärztl. Wschr. und Wiener Tierärztl. Mschr., Jg. 43. Nr. 13/14, S.98. [Equine infectious anaemia. Continuation of Eberbeck-Fortner controversy.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* May 28th. 167. [See also *V. B.* 15. 263.] 1134

In an earlier discussion on E.I.A. [see *V. B.* 16. 144] FORTNER cited EBERBECK as asserting that infectious anaemia should not be associated with a specific virus and expressed his disagreement. In this note EBERBECK accuses FORTNER of ignoring the results of his work and repeats his conviction that the difficulty of differentiation between equine infectious bronchitis and E.I.A. indicates that further experimental work is necessary for the complete understanding of the aetiology of E.I.A.—W. M. HENDERSON.

I. \*BENEDEK, L. (1944.) [A virus disease of cattle in Hungary.]—*Közl. Osszehas. élet- és Kortan Kőreből.* 32. 189. 1135

II. \*CSONTOS, J., & DERZSY, D. (1944.) [A virus disease of cattle in Hungary.]—*Ibid.* 198. 1136

[Absts. from Absts. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 276.]

I. In many parts of Transylvania there occur cases of a disease in cattle apparently of virus origin. Three clinical forms are recognized. There is a mild form, with some fever, excessive appetite, injected mucous membranes and a serous discharge from the eyes and nose, and later, with cessation of rumination, constipation, an increased pulse rate and dyspnoea; and recovery usually takes place. In the subacute form, characterized by haemorrhage and blood-stained faeces, with the development of a moribund condition in 2-3 days, recovery is still possible, especially in young animals. In the acute form there is severe haemorrhage apparent by the appearance of quantities of blood at all the natural orifices of the body and death within a short time.

Findings P.M. in a mild case include sub-mucous haemorrhages and large collections of blood in the lungs; in subacute and acute forms there are everywhere signs of an acute haemorrhagic diathesis with accelerated blood coagulation. No bacteria have been incriminated as the cause in either the blood or the tissues. The subcutaneous injection of two cattle two years old with a bacteria-free tissue filtrate resulted in the development of a non-fatal febrile condition with accelerated clotting of the blood after an incubation period of five days; in one animal there was also some intestinal bleeding.

II. Bacteriological and histological examinations and transmission experiments supplementary to those described in I showed that the disease could be transmitted serially in cattle by subcutaneous injection and by drenching with bacteria-free blood and tissue filtrates, so that eventually the artificially produced disease corresponded with the natural condition. It was found that the virus is originally present in the blood but later can be demonstrated in the organs. In natural cases the histological changes, besides those of a severe haemorrhagic diathesis, are acute degeneration of the parenchymatous organs, especially the liver and kidneys, and of the ganglion cells of the brain stem; there are also compact foci-like accumulations of lymphocytes. The disease is said to have many points of resemblance to swine fever and to cattle influenza. [Points in common with rinderpest might also be noted.]—W. M. HENDERSON.

DOYLE, L. P., & HUTCHINGS, L. M. (1946.) A transmissible gastroenteritis in pigs.—*J. Amer. vet. med. Ass.* 108. 257-259. 1137

The authors describe sporadic outbreaks of a disease in pigs characterized clinically by vomit-

ing, diarrhoea, rapid loss of weight and a very high mortality, particularly in young pigs.

A noteworthy observation was that sows were affected only when the disease appeared in the litter. Observation also suggested that a solid immunity was present in pigs previously affected. The evident pathological lesion was an acute gastro-enteritis, with engorgement of the lymphatics. Degenerative changes were also found in the kidneys. The incubation period was short.

The experimental work relating to the causative agent and mode of transmission are summarized as follows:—Transmission by contact was readily produced. Feeding small quantities of triturated gastro-intestinal tract was followed in 24–48 hours by transference of infection to all pigs. Within six days 95% of the young pigs died. The sows recovered. Experiments were carried out in five litters with filtrate cultured and found bacteria-free. Four of the five litters became infected, the lesions and clinical symptoms being similar to those in the natural infection, but slightly less virulent. A mortality of 50% resulted in the infected litters. An attempt to infect a day-old calf by oral administration of triturated stomach and intestine from an affected pig was not successful. The causative factor was found to remain active when the gastro-intestinal tract was frozen for several weeks.

A control experiment to eliminate swine fever was carried out in which a pig unaffected by an inoculation of blood from gastro-enteritis cases was subsequently infected with S.F. virus and died. Swine fever antiserum did not protect against this form of gastro-enteritis.

Penicillin and sulpha drugs were found to be of no value in controlling the course of the disease.

The authors discuss the problem of naming this disease, but decide to await more precise information as to the nature of the causative agent.

—W. R. KERR.

GEIGER, W., & WEIS, V. (1944.) Hundestaube und Grippe. [Dog distemper and human influenza.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 270–271. 1138

The relationship between the canine distemper virus and the human influenza virus has frequently been investigated. The authors review the work previously described and cite the case of a woman who suddenly fell ill, with typical distemper symptoms, after nursing for several weeks a dog with severe distemper. On the 41st day of her illness two puppies were inoculated with

See also absts. 1146 (fowl leucosis), 1220 (dog distemper), 1261 (neoplasms), 1255 (myxoma).

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her blood, whilst a third was kept isolated as control. During the next fortnight no raised temperature nor any pathological symptoms were observed. Then the three puppies were inoculated with 2 ml. virulent distemper virus and reacted with fever and conjunctivitis on the third day.

From observations over many years the authors conclude that there is neither identity nor relationship between these viruses: the similarity of symptoms is explained by the action of identical secondary bacteria (*H. influenzae*, *H. bronchisepticus*).—C. AHARONI.

[TOPLEY & WILSON (1946) include *Brucella bronchiseptica* within the genus *Haemophilus*. The *Veterinary Bulletin* proposes to follow this rule in the future.]

SCHÜRMANN, E. (1943.) Zur Diagnose der Geflügelpest. [The diagnosis of fowl plague.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 25th. 195–198 and July 9th. 215–218. 1139

In various parts of Germany in 1942 a disease occurred among poultry and pheasants which did not appear to be identical with fowl plague. A detailed description is given of the findings P.M. and results of histological and the bacteriological examination of a group of hens from an affected flock. The lesions were similar to those of fowl plague, with the exception that no perivascular cellular infiltration and no inclusion bodies were found in sections of the brain. No pasteurella organisms were found in stained smears of spleen tissue. The liver, spleen, ovary and heart blood were examined culturally and *S. pullorum* was frequently isolated, especially from the liver and ovary; in two hens *S. enteritidis* was recovered.

Transmission experiments were conducted using a tissue suspension and a bacteria-free filtrate of a tissue suspension, the disease being successfully reproduced following intramuscular and subcutaneous inoculation. The incubation period was 7–8 days, instead of the 2–3 days of typical fowl plague. Following a lengthy review of the aetiology, clinical signs and pathology of fowl plague, together with a consideration of the differential diagnosis of Newcastle disease, typhoid-paratyphoid infection and VIANELLO's "Italian fowl disease" [avian laryngo-tracheitis—see V.B. 13. 170], S. concludes that the condition described should be diagnosed as fowl plague in an atypical form, caused, possibly, by a variant of the true fowl plague virus.—W. M. H.

PONS, R. (1942.) Action du formol sur les antigènes et les anticorps. (Propriétés affines et fonction amine primaire: NH<sup>2</sup>.) [Action of

formol on antigens and antibodies.]—*Rev. Immunol.* 7. 222–230. 1140

P. discusses the action of formol on antigen

and antibody under varying conditions of time of formolization, concentration, temperature and pH.

The action of formol on various toxins and antisera appears to depend on its effect on the

*See also absts.* 1102 (tuberculin test), 1111 (pasteurellosis), 1114, 1116 (salmonella), 1121 (tetanus), 1131 (influenza), 1133 (equine encephalomyelitis), 1208 (staphylococcus anatoxin), 1265 (bovine brucellosis).

amine group  $\text{NH}_2$ . The affinity of an antiserum for a toxin varies according to the amount of free amino groups in the serum globulins.

—S. J. G.

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

\*GELORMINI, N. (1940.) Bionomia del *Boophilus microplus*.—Contribución inicial a su estudio. [*Bionomics of Boophilus microplus.*] pp. 117. [Abst. from review in *Gac. vet., B. Aires*. 2. 88–89.] 1141

The book begins with a brief life history of *Boophilus microplus*, followed by descriptions of experiments conducted to ascertain the effects of

humidity and temperature on 500 female ticks.

A temperature of  $19^\circ\text{C}$ . accompanied by a humidity of 48–97% impeded oviposition, whilst a temperature of  $32\text{--}33^\circ\text{C}$ . accompanied by a humidity of 36–88% gave the best results.

The longest survival time of any *Boophilus* was 66 days. After ovipositing they generally died within 5–10 days.—J. H.

*See also absts.* 1221–1229 (D.D.T.), 1242 (anaesthesia of insects), 1253 (mites), 1255–1268 (fly strike dressings, lice, mites, ticks, buffalo fly), 1262 (tsetse fly), 1263 (warble fly).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

TRAVASSOS, L. (1944.) Revisão da família Dicrocoeliidae Odhner, 1910. [*Revision of the family Dicrocoeliidae Odhner, 1910.*]—*Monogr. Inst. Osw. Cruz*. No. 2. pp. 357. 1142

This monograph deals mainly with a systematic revision of the family Dicrocoeliidae. Following an account of the anatomy of members of the family in general, there is an historical review of the literature dealing with the systematics of these flukes. T. next discusses his proposed classification of the family and divides it into three sub-families: Dicrocoeliinae, Infidinae, n. subfam., and Mesocoeliinae, the last of which is not dealt with in this monograph. In the Dicrocoeliinae are included 21 genera of which seven are new. Under each species the following information, where known, is given: synonymy, morphological description, habitat, final and intermediate hosts, geographical distribution, and notes of a general character. Preceding a bibliography of 815 references and an index of the scientific names used in the monograph, there is a host list in which is included the habitat of the various parasites. Of the 140 species dealt with, only about four are of importance to the veterinarian in that they parasitize domesticated mammals, viz. *Dicrocoelium dendriticum*, *D. hospes*, *Eurytrema pancreaticum* and *E. coelomaticum*. Illustrating the monograph are 124 plates of 492 figures.—J. N. OLDHAM.

*See also absts.* 1230, 1231, 1255, 1256 (anthelmintics, and life cycle of helminths).

DE JONG, J. J., & STEGENGA, T. (1945.) Maagstrongylose bij jongvee. [*Stomach worms in heifers.*]—*Tijdschr. Diergeneesk.* 71. 260–270. [English and French summaries: abst. from English summary.] 1143

Among a herd of heifers in Friesland a large number had diarrhoea and emaciation caused by gastritis and the presence of trichostrongyles and *Cooperia*. Elsewhere in the province of Friesland the authors also noticed mortality among heifers. As strongyles were absent it is supposed that a dietary deficiency was the cause.

COMMÉNY, H., DRIEUX, H., & VERGE, J. (1946.) Localisation hépatique d'*Ascaris suum*. [*Localization of A. lumbricoides in the liver.*]—*Bull. Acad. vét. Fr.* 19. 190–195. 1144

At P.M. examination of a pig, which had shown symptoms of intermittent colic and was debilitated, several fully developed specimens of *A. lumbricoides* were found in the parenchyma of the liver. This invasion of the liver had resulted in a general inflammation of that organ with miliary abscesses.

The authors trace the life-history of *A. lumbricoides* with its larval migration. They also recapitulate references to the discovery of the parasite and allied species in the liver and other abnormal habitats. It is postulated that these ascarids reached the liver from the intestine, by penetration of the bile duct.—D. W. JOLLY.

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

PIRES, A. (1944.) Contribucion al estudio de los tumores de pene en el caballo (1). [*Tumours of the penis in horses.*]—*An. Fac. Med. vet.*

*Univ. La Plata.* 7. 127–164. [English, French and German summaries.] 1145

Of 7,998 horses examined at the Clinical

Institute of the Faculty of Agriculture and Veterinary Science, Buenos Aires, during the years 1937-42, 82 (1.02%) had tumours: 24 on the penis, 13 in the eyes and eyelids, 11 in the tail and perineal region, nine in the vulva, eight in the nasal cavity, four in the prepuce and 13 in other areas. Twenty-two of the tumours of the penis were squamous epitheliomata, one was a melanosarcoma and one a papilloma. It is suggested that tumours of the penis are associated with repeated trauma and persistent phimosis. D. discusses prognosis in these tumours and the

See also absts. 1239 (stilboestrol in treatment), 1241 (oestrogens in treatment), 1261 (cancer research).

## DISEASES [NON-INFECTIVE] OF BREEDING STOCK

LAING, J. A. (1945.) **Observations on the survival time of the spermatozoa in the genital tract of the cow and its relation to fertility.**—*J. agric. Sci.* 35. 72-83. 1147

Since satisfactory induction of ovulation by administration of hormone was impossible and as palpation of the ovaries might interfere with physiological processes, ovulation was assumed to occur 12-18 hours after the end of heat. Inseminations were made at varying intervals after ovulation and fertilization was determined by slaughtering the cows several days later and searching for early embryos.

Twenty-three cows were inseminated at intervals varying from 55 hours before heat ended to 25½ hours after. No fertilized ova were found in four cows inseminated more than 16 hours before the end of heat. Fertilized ova were found in all of nine cows inseminated at intervals from 16 hours before up to the end of heat. Of eight cows inseminated after heat had ended, fertilization occurred in four only.

The findings suggest that sperm can survive from 16 hours before heat up to the end of it and that the time of ovulation, as related to the end of heat, is variable. Post-oestral insemination is thought to have failed in cases where ovulation had been unduly early.—F. L. M. DAWSON.

VAN DRIMMELEN, G. C. (1945.) **The location of spermatozoa in the hen by means of capillary attraction.**—*J. S. Afr. vet. med. Ass.* 16. 97-101. 1148

The author reviews the literature dealing with the detection and the survival of spermatozoa in the genital tract of the hen. He describes a new technique for the recovery of active and morphologically normal spermatozoa from the genital tract after natural copulation or artificial insemination *per vaginam* of virgin birds. Intravenous injections of 0.7-0.8 ml. nembital (6.6% solution of pentobarbital sodium) and the administration of small doses of the drug (*i.e.*, 0.3 ml.

results of surgical interference, the operations advocated being described.—I. W. JENNINGS.

DE SALLES, J. F. (1943.) **Leucose linfóide hemocitoblástica da galinha. [Haemocyto-blastic lymphoid leucosis of the domestic fowl.]—*Mem. Inst. Osw. Cruz.* 39. 385-388. [English summary.] 1146**

In two cases of leucosis in the hen there was great enlargement of the liver, although the shape in general was retained. Microscopic examination revealed an infiltration of haemocyto-blasts.

—J. H.

intravenously) maintained the circulation and body heat and allowed the search for spermatozoa to be extended over a whole day. The various parts of the genital tract were searched for spermatozoa by examining microscopically the fluid withdrawn by means of capillary attraction. For this purpose a glass bacterial (Pasteur) pipette was used with the point long and finely drawn out but without the teat normally used in bacteriological work. With this technique decreasing quantities of diluent were necessary as sufficient fluid was present round the ripening follicles in all parts of the oviduct except the vagina.

The findings were that after natural copulation active spermatozoa survived in all parts of the oviduct for 24 hours. For 24-48 hours they were often still present in the vagina and infundibulum. After artificial insemination with large doses of semen (0.25-1.0 ml.) the spermatozoa were not readily found in the centre portions of the oviduct after 24 hours. In one case large numbers were still active in the uterus, albumen region and infundibulum after about 72 hours. In another case an active spermatozoon was recovered from the infundibulum on the 14th day. In cases in which there was intraperitoneal injection of large doses of spermatozoa none were recovered after 24 hours from the peritoneal cavity or around the ovaries but they were present in all parts of the genital tract. Active sperm cells were recovered from the infundibulum of one bird on the 11th day and in another on the 12th day. The author concludes that in the fowl ovulation can be followed by successful impregnation as long as 14 days after separation from the cock.

—P. L. LEROUX.

DAWSON, A. B., & KOSTERS, B. A. (1944.) **Pre-implantation changes in the uterine mucosa of the cat.**—*Amer. J. Anat.* 75. 1-37. 1149

The morphological appearance of the uterine mucosa of the cat during the period from proestrus to implantation is described. Ovulation was found

to occur early in the second day after mating and marked changes in the surface and glandular epithelium followed the introduction of this luteal phase. Deposition of glycogen, with displacement of nuclei in the surface epithelium, reached a maximum seven days after mating, from which stage the surface epithelium was thrown into folds. The uterine glands became enlarged and tortuous and opened into the uterine lumen at the base of the crypts formed by this dentate-like folding of the surface layer. The hormonal activity during these stages is discussed. The presence of a fertilized ovum in the reproductive tract cannot be said to be responsible for the immediate post-ovulatory endometrial changes, as they are the same whether they follow a successful mating, a sterile mating or mechanical stimulation of the cervix.—C. W. OTTAWAY.

WILLIAMS, P. C. (1944.) **Ovarian stimulation by oestrogens. [1] Effects in immature hypophysectomized rats.**—*Proc. Roy. Soc. Ser. B.* 132. 189–199. 1150

WILLIAMS, P. C. (1945.) **Ovarian stimulation by oestrogens. [2.] Stimulation in the absence of hypophysis, uterus, and adrenal glands.**—*J. Endocrinol.* 4. 125–126. 1151

1. The rapid fall in ovary weight that follows hypophysectomy in immature rats can be prevented, for at least 15 days, if the animals receive 120 µg. diethylstilboestrol or 100 µg. oestrone daily. Histological examination of the ovaries suggested that stimulation of the membrana granulosa occurred. Atrophy of the interstitial cells was not prevented. Injections of anti-gonadotropic serum did not interfere with the effect, indicating that any gonadotropin circulating in the blood after hypophysectomy played no part in the reaction. No evidence was obtained to indicate that the primordial follicles were stimulated. Oestrogens, therefore, are not gonadotropic in the usual sense of the term. The exact significance of this phenomenon in the normal regulation of ovarian function requires further investigation.

2. Ovarian stimulation by oestrogens is unaffected by removal of the uterus or of the uterus and adrenal glands.—A. T. COWIE.

WALSH, R. J. (1945.) **Aetiology of haemolytic disease of the new-born.**—*Med. J. Aust.* July 14th. 33–39. 1152

An investigation of haemolytic disease of the new-born in 106 families is recorded, in which criteria for investigation were clinical and pathological data. W. found that 92% of mothers of the affected children had Rh-negative blood. In a random selection of the population, 15% had Rh-negative blood. The figures obtained by W.

are comparable with figures obtained by current workers, who are cited. The pathogenesis of the disease is considered for the cases in which the mother has Rh-negative blood, and for the rarer instances in which the mother has Rh-positive blood. W. refers to repeated miscarriages, multiple stillbirths and physiological jaundice in humans and argues against the possible relationship of the Rh-factor in the aetiology of these.

—D. A. TITCHEN.

SCHMIDT, W. (1944.) **Zuchtschäden und Fütterung. I. Allgemeine Betrachtungen. II. Einfluss der Winterfütterung auf die Fortpflanzung des weiblichen Rindes. III. Einfluss der Sommerfütterung auf die Fortpflanzung des weiblichen Rindes. [Reproductive disorders and their relation to diet. I. General observations. II. Winter feeding and bovine fertility. III. The influence of summer feeding on bovine fertility.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* July 21st. 229–234 and August 4th. 251–253. 1153

This is a discussion of the infertility problem in N. Germany, directing attention to the types of husbandry thought to be responsible. The incidence of infertility is less on smallholdings than on the intensively cropped larger farms where arable products are substituted for pasture and hay. In order to combat all forms of infertility, including brucellosis, the first object should be to build up general health and resistance to infection by means of correct feeding. The specific influence of dietary factors on reproductive processes is not discussed. The main recommendations for maintaining fertility of dairy cows are:—to provide pasture in summer and good hay, preferably lucerne, in winter as the staple diet; to ensure adequate mineral and protein supplies from herbage by correct manuring and pasture management, to avoid feeding sugar-beet leaves and other beet products and to use silage sparingly.

—T. H. FRENCH.

— (1945.) **[Discussion on] Infertility in cattle.** [Speakers: DALLING, T., FOLLEY, S. J., SCORGIE, N. J., CLARKE, C. H., REES-MOGG, G., BLEDISLOE, VISCOUNT, GOULD, G. N., GARDNER, C. H., LEA, H., THOMSON, L., STEVENS, H., SMITH, G. R. W., GARNER, F. H., THOMPSON, F. N., & PORTER, J.]—*J. Fmr's Cl., Lond.* Part 6. pp. 74–88. 1154

Experience at artificial insemination centres has shown that temporary infertility is not uncommon in bulls, but that methods whereby this can be overcome have yet to be determined. Fluctuations in the degree of fertility of the bull are of great importance, especially when the bull is mated to cows which are not on the highest level of fertility.

In addition to cystic ovaries and persistent corpus luteum, infertility may often be due to death of the ovum soon after fertilization, or the fertilized ovum may fail to become implanted. The plane of nutrition as well as specific diseases such as brucellosis, trichomoniasis and TB. may also cause infertility. A vaccine prepared from strain 19 has been found very satisfactory in reducing the incidence of brucellosis, but both trichomoniasis and TB. of the genital tract may be more widespread than is generally supposed.

The main points raised in the discussion on the paper were that proven bulls are extremely difficult to obtain and more research work is required to find methods of prolonging the useful life of such sires. In spite of the satisfactory results obtained in small animals, pregnant mare's serum has not proved very useful in treating winter anoestrus in cattle.

There appears to be a relationship between

milk yield and sterility. Heavy milking has been shown to disturb the hormone balance in small experimental animals so that this factor may account for infertility in high yielding cows. The examination of cervical mucus has proved to be a reliable method for the detection of oestrus.

Due attention must be paid to hereditary factors, since it is well known that certain strains of cattle died out on account of sterility. Breeding animals should be selected for fertility as well as for the more obvious characteristics.

The difficulty of getting heifers in calf between Christmas and Easter may be due to feeding a ration deficient in protein. In one experiment, extra protein induced the reappearance of the oestrous cycle in a group of animals, whereas a control group receiving no extra protein remained in the anoestrous state.

Bad hygiene and bad herd management are undoubtedly responsible for much infertility.

—J. A. NICHOLSON.

See also absts. 1188-1190 (light and sexual activity), 1240 (anaphrodisia), 1271 (constitution in animal breeding), 1255, 1256 (subterranean clover and genital disorders in sheep).

## DISEASES, GENERAL

DAUZATS. (1939-40.) Brèves notes de pathologie ovine dans le Nord-Cameroun. [*Sheep diseases in the North Cameroons.*]—*Rev. Méd. vét. Toulouse*. 91. 502-508. 1155

Ovine pleuro-pneumonia is considered the most important enzootic of sheep in the North Cameroons. The symptoms and lesions found P.M. are described. A mortality of 95% may be expected in untreated animals, but early cases in young sheep may be completely cured by intravenous injection of 1-2 ampoules of "synthol" [composition not stated] twice daily for five days.

Contagious ecthyma is common in lambs. A vaccine can be prepared by pulping the crusts in a mortar with glycerin: it is applied to the scarified skin of the inside of the thigh.

Taeniasis is treated with 1% copper sulphate solution, stovarsol (10 mg. per kg. body weight), or areca nut (1-3 g. daily according to size). For coccidiosis, stovarsol is given in the same dose. Liver flukes are rare. Psoroptic mange is serious and is treated with a decoction of local tobacco and 2% creosote.

Trypanosomes are frequently encountered, but always in association with some other pathogenic organism. No attempt has therefore been made to assess their importance. Other pathogenic organisms include *H. contortus*, *echinococcus* (in sheep from the Northern Territory) and *Corynebact. ovis*, causing caseous lymphadenitis in sheep.—R. MACGREGOR.

HURST, E. W. (1941.) **Demyelination: a**

**clínico-pathological and experimental study.**

—*Med. J. Aust.* Dec. 13th. 661-666. 1156

H. discusses demyelinating diseases in man and animals and describes experimental work with potassium cyanide, sodium azide and carbon monoxide in the production of demyelination. The specific mechanisms by which the lesions are produced in the naturally occurring diseases are unknown, but anoxia of the central nervous system, which may or may not be histotoxic, appears to be the main factor in the production of experimental lesions.

Emphasis is placed on the continuous series of lesions, from cortical necrosis to demyelination, that occur with variations in intensity and frequency of the experimental anoxia, severe anoxias causing major damage to cerebral and cerebellar cortex and less severe anoxias causing demyelination of the white matter. It is pointed out that in the naturally occurring diseases there is a predominant, but by no means exclusive, localization of the morbid process in the white matter, but no attempt is made to explain the aetiology of these diseases on the experimental work done so far.

—D. C. BLOOD.

HOWARTH, S., & SHARPEY-SCHAFER, E. P. (1947.)

**Low blood-pressure phases following haemorrhage.**—*Lancet*. 252. 18-20. [Authors' summary slightly amended.] 1157

Three low blood-pressure phases after haemorrhage have been investigated.

Phase I is the sudden vasovagal reaction with

bradycardia and muscle vasodilatation which develops suddenly during or after bleeding.

Phase 2 is associated with increased heart-rate, low right auricular pressure, and low cardiac output. Large transfusions raise right auricular pressure, cardiac output, and blood pressure.

Phase 3 takes time to develop and may persist over long periods. Severe anaemia may be a causal factor in this phase. Right auricular pressure and cardiac output are increased. Large transfusions may be dangerous from overloading.

— (1943.) Dummkoller. [**"Dummkoller" of horses.**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 133–135. 1158

This is a report of judgment in a law suit in which the plaintiff claimed that a mare he had purchased from the defendant did not eat normally, behaved oddly and had to be slaughtered. Evidence was given to the effect that nervous disturbances were shown by the horse within a few days after its sale; the symptoms included abnormal stance, failure to react to food and water, loss of sensitivity of parts of the body surface when stimulated and disturbances of equilibrium. The veterinary surgeon who gave evidence for the defendant maintained that the symptoms were caused by a muscular disorder ("lumbago"). Examination P.M. revealed no significant lesion, apart from thickening of the meninges at the base of the cerebellum. Had "lumbago" [equine myoglobinuria] been considered the cause of the symptoms it was clearly the duty of the defendant's veterinary surgeon to examine the urine; this was not done. That the condition was incurable and progressive was shown by the fact that the animal had to be slaughtered three weeks after purchase. The thickening of the meninges could not be considered sufficient to account for the symptoms. The occurrence of sudden changes in temperament did not support the view that *Dummkoller* was the cause of the condition and the court came to the conclusion that the occurrence of this disease was not proven. The case was heard by the Veterinary Court of Justice of the University of Berlin.—E. G. WHITE.

DIMIĆ, J. M. (1945.) Klinički problem mesečnog slepila kod konja. [**Clinical problems of periodic ophthalmia in horses.**—*Vet. Arhiv.* 15. 189–201. [Abst. from French summary.] 1159

Periodic ophthalmia cannot be distinguished from certain ocular complications following infectious diseases. After severe attacks, relapses do not occur because of thrombosis of the blood vessels. In less severe cases, medical treatment may prevent relapses, but the eye fails to regain full function. Because of the war it was not

possible to follow up the offspring of affected animals.—M. L. LEVI.

WYSSMANN, E. (1944.) Über Myoglobinaemia paralytica (Kreuzschlag) des Pferdes. [**Equine myohaemoglobinuria paralytica (lumbago).**—*Schweiz. Arch. Tierheilk.* 86. 319–335. 1160

The age susceptibility, prevention and treatment are discussed. Bleeding is considered to be the best treatment and it is suggested that it produces its favourable results by reducing congestion in the capillaries of the muscles.—R. M.

PIRES, R. E. (1942.) Ossificação em pulmão de bovino. [**Ossification of a bovine lung.**—*Rev. Fac. Med. vet. S. Paulo.* 2. No. 2. 79–84. [English summary.] 1161

P. describes the lower two-thirds of a lung received from an abattoir, without the lymph nodes or other organs and without any history. A portion of the pleura was white and thickened and covered a hard bony mass about 10 c.m. in diameter. On section this was found to consist of laminae like the scales of a fish. Histological examination revealed that these scales were ossified cells forming the alveolar walls. The lumina of the alveoli were dilated and communicated with each other as in an emphysematous lung. The connective tissue and blood vessels were normal, as were the smaller and medium bronchioles, but the cartilages in the larger bronchioles tended to ossify. Osteoblasts were present in all osseous formations. The growth merged gradually with the surrounding tissue. The rest of the lung and pleura was normal.—R. MACGREGOR.

CALVO, S. P., & SALCES, F. (1944.) Un caso de vulvo-vaginitis contagiosa ulcero-necrosante, en bovinos. [**Occurrence of infectious vulvo-vaginitis in cattle.**—*Bol. tec. Direcc. gen. Ganad., B. Aires.* No. 11. pp. 826–830. 1162

The epizootic described took place in a herd of 85 cross-bred Friesians. The first cases were discovered in two heifer calves 2–4 weeks old and in spite of their isolation, the disease spread to all the heifers on the farm. The bull calves at no time had genito-urinary lesions.

In the heifers the disease took the form of a spreading necrosis and gangrene of the entire perineal region. The local application of antiseptics failed to stop the spread of the lesions and five out of 17 heifers died as a result of secondary invasion by pyogenic and necrotizing bacteria. The remaining animals were cured by cauterization of the lesions with copper sulphate, followed by the application of carbolic ointment and, later, of zinc oxide and picric acid ointment. The tissue destruction resulted in deformities which had to be treated surgically.

It is of interest to note that the pastures of

the farm were in poor condition from lack of rain, and that the wheat, oats and barley were affected with *Toxoptera graminum*, so that feeding had to be supplemented with maize, which was mouldy and given to the animals uncooked.—I. W. J.

RAINEY, W. (1943.) **Clinical comparison of acetonaemia in the lactating cow and the pregnant ewe.**—*Aust. vet. J.* 19. 111–115. 1163

R. observed about 200 cases of acetonaemia in the north-west coastal district of Tasmania. Of these cases about 20 died, of which eight developed haemoglobinuria. R. considers it difficult at times to differentiate between the so-called "parturient haemoglobinuria" cases and the acetonaemia syndrome of lactating cows. It was found that haemoglobinuria occurred 10–14 days after parturition, whereas simple acetonaemia occurred any time during lactation. Clinically R. found similarities between pregnancy toxæmia of sheep and acetonaemia of dairy cows. Common to both conditions were inanition, uncertain gait, inhibition of hepatic and intestinal function, smell of acetone, and the rapid throbbing pulse. Autopsy findings were similar. In sheep the main difference observed was the complete absence of any tendency to spontaneous recovery or even recovery as a result of treatment. R. postulates that this difference is due in the case of the cow to the diminution of lactation, whereas in the ewe pregnancy continues. R. has observed few cases of acetonaemia in which the cow calved in early summer when succulent green feed was abundant and the weather warm. However both simple acetonaemia and parturient haemoglobinuria have been observed in cows grazing on an abundant winter crop of green oats, the possible explanation being a lack of nutritive elements in winter crops. Adverse seasonal conditions and the drain of lactation are considered to be important in the aetiology of acetonaemia.—D. A. TITCHEN.

See also absts. 1113 (horses), 1137 (gastro-enteritis in pigs), 1177, 1178 (non-sweating in horses), 1209 (lymphangitis in horses), 1274 (common diseases of domestic animals).

OLCOTT, C. T., SAXTON, J. A., & MODELL, W. (1946.) **Medial hyperplasia in pulmonary arteries of cats.**—*Amer. J. Path.* 22. 847–853. 1164

In routine examination of cats' lungs, three cases were found of chronic hypertrophy and hyperplasia of the smooth muscle of the intrapulmonary arteries. The lesion was restricted to the tunica media and had a thick layer of concentrically arranged spindle-shaped cells with the structure of large smooth muscle cells. Measurements comparing thickness of wall with the lumina of vessels are given and compared with corresponding ratios in controls and with extrapulmonary arteries in the cats under examination which were apparently normal. No cause of the lesion is advanced.—C. W. OTTAWAY.

HAMMARSTEN, G. (1945.) **The formation of the nucleus of stone in the urinary passages.**—*J. Path. Bact.* 57. 375–378. 1165

The nucleus of a kidney stone consists commonly of any kind of foreign body, such as desquamated epithelium or bacteria. Such nuclei are formed mainly in infected urine. In non-infected urine, sulpha drugs, such as acetyl-sulphathiazole and sulphadiazine, and also calcium oxalate, are able to stimulate the formation of stones, when their concentration in the urine reaches saturation point. When this happens, colloidal drops, the so-called micellae of the substance separate out. Under the microscope, these resemble drops of oil from a few to 50 $\mu$  in diameter. Later, these drops crystallize out as radiating structures on which further layers of the stone-forming substance are laid down. Together with precipitated urinary colloids, a collection of these crystallized micellae forms the nucleus of the kidney stone. The micellae are stable and it is possible that they may form cylinders in the renal channels.—I. W. JENNINGS.

## NUTRITIONAL AND METABOLIC DISORDERS

— (1946.) **World problems of nutrition, F.A.O. conference at Copenhagen.**—*Lancet.* 251. 463–464. 1166

The work of the annual conference of the Food and Agricultural Organization held at Copenhagen in September, 1946, is summarized. The establishment of a World Food Board to stabilize prices of agricultural commodities throughout the world and to establish a food reserve against emergency arising out of crop failures was discussed and a commission appointed to draw up a detailed plan. Stress was laid on the need for study of methods used in the milling

of cereals and their possible effects on nutrition. Education in nutrition, national nutrition committees, nutritional standards and utilization of cereals were also discussed. Whether cereals are best utilized by direct consumption or indirectly through animals depends on the nutritive value of the particular cereal, the efficiency of its conversion by animals into human food, the relative cost of the plant and animal products and their acceptability to the consumer. Further study is recommended of the most satisfactory and economical balance between the production of meat and milk and between table poultry and eggs.—M. C.

RESTARSKI, J. S., GORTNER, R. A., Jr., & McCAY, C. M. (1945.) A method for measuring the effects of acid beverages on the teeth of small laboratory animals.—*Science*. 102. 404-405. 1167

The effects of various acid beverages were measured by assessing microscopically the extent of destruction of the enamel on the lingual surfaces of each molar. Results obtained by this method compared favourably with those obtained by determination of the enamel content of complete sets of molars with varying degrees of enamel destruction.—JEAN P. BUXTON.

SHAW, J. C., & DAUGHERTY, F. C. (1946.) The influence of high-protein and low-protein high-starch diets on blood glucose and acetone bodies of pregnant ewes.—*J. Anim. Sci.* 5. 180-186. 1168

Groups of ewes were maintained throughout pregnancy on diets high in protein and on diets allowing a low protein, high starch intake and their total energy consumption was restricted, in order to observe the effects on their levels of blood glucose and total acetone bodies. Those maintained on a diet low in protein for over three months before lambing developed no significant hypoglycaemia or acetonæmia even when the energy intake was reduced to about 50% of the normal requirement. A mild hypoglycaemia was found in groups on diets high as well as those low in protein following parturition, possibly resulting from the increased energy demands for milk secretion. It appears that some factor other than a simple energy deficiency is responsible for the increased incidence of ketosis in ewes under ordinary farm conditions during the latter part of pregnancy.—A. EDEN.

JARL, F., & HYDÉN, S. (1945.) Orienterande utfodringsförsök med jodkasein till mjölkkor. [Feeding tests with iodinated casein in the milch cow].—*Särtr. Förhandsmedd. Lantbr.-ögsk. HusdjFörsöks*. No. 46. pp. 10. 1169

The administration of iodinated casein to milch cows has the same effect as thyroxin and increases the milk yield during the part of the lactation period between maximum yield and drying off. On an average, for two groups of cows, the amount of milk increased by 29.5% and the fat content by 3.8%, calculated on the weighed average of the yield during the preliminary and the after period. No increase in yield occurred if the iodinated casein was fed immediately after calving, before the yield passed the maximum. —R. PETER JONES.

BENDIXEN, H. C. (1946.) Om Mangelsygdomme hos vore Husdyr. [Deficiency diseases in

domestic animals.].—*Maanedsskr. Dyrlaeger*. 58. 78-82. 1170

After a short review of the work on deficiency diseases in the last 30-40 years, the results of lack of vitamin A in pigs and calves and of lack of cobalt in calves and other young animals are described. The latter condition was widespread in Jutland during the war years and led to much loss on the stock farms. It could be cured by giving a salt lick containing cobalt or a solution of cobalt chloride in the drinking water. The "coast disease" of Southern Australia, the "wasting disease" of South West Australia, the "bush sickness" of New Zealand, the "pining" of Scotland and the "salt sickness" of Florida have all been shown to be due to deficiency of cobalt.

Another group of deficiency diseases, represented by milk fever, which is probably due to drainage of the affected animal's mineral and other resources by high milk production, is also discussed. B. considers that the chronic indigestion known as "small-holders' disease" may come into the same category.—M. E. ROBERTSON.

SOBEL, A. E., ROCKENMACHER, M., & KRAMER, B. (1945.) Composition of bone in relation to blood and diet.—*J. biol. Chem.* 159. 159-171. 1171

This is a continuation of the study of the effect of variation in calcium and inorganic phosphorus in the diet on the serum and bone content of calcium, phosphorus and carbonate [see *V. B.* 16. 53]. In six out of seven experimental groups of rats the analysis of bone gave an excess of base over that required by the formula  $\text{CaCO}_3 \cdot n[\text{Ca}_3(\text{PO}_4)_2]$ . In the seventh group, on a low phosphorus-high calcium diet, the bone had more phosphate than that required by the formula, indicating the presence of  $\text{CaHPO}_4$ , a substance thought to be important in bone deposition. The composition of bone was related to that of the blood serum, which in turn was related to the composition of the diet. Vitamin D tended to prevent rapid changes in serum composition with changes in diet.—R. MARSHALL.

CORRELL, L. (1942.) Maelkens Vitaminer. [The vitamins of milk.].—*Maanedsskr. Dyrlaeger*. 53. 566-580. 1172

This is a general review. There is reference to the variation in the concentration of vitamins A, C and M, due to seasonal changes in the diet of cows, and the influence on the milk vitamins of pasteurization, cooling, the type of container and light are discussed.—E. F. MCCARTHY.

\*GREILING, G. (1942.) Untersuchungen über das Vitamin B<sub>1</sub> im Harn gesunder Ziegen. [Vitamin B<sub>1</sub> in the urine of goats.].—*Inaug.*

*Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/59. 235.] 1173

The average level in the urine of vitamin B<sub>1</sub> was 320 µg. %. Intake of food with a higher vitamin B<sub>1</sub> content increased the excretion of the vitamin. Intramuscular injection of 5 mg. vitamin B<sub>1</sub> caused a marked rise of the vitamin B<sub>1</sub> in urine, but five hours after the injection the excretion of vitamin B<sub>1</sub> became almost normal. The lowest concentration of vitamin B<sub>1</sub> was found in urine excreted during the night.—E. KODICEK.

PEARSON, P. B., & DARNELL, A. L. (1946.) *The*

*See also absts.* 1106 (cobalt), 1153 (reproductive disorders), 1163 (acetonaemia), 1184 (anaemia in piglets), 1255-1256 (trace elements).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

I. SCHELLHASE. (1944.) Ueber Milchperoxydase und ihren Nachweis. [*Milk peroxidases.*] —*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 3rd. 75-76. 1175

II. ZARIBNICKY. (1944.) Erwiderung auf den Artikel von W. Schellhase "Milch-peroxydase und ihr Nachweis". [*Reply to the article on milk peroxidases by Schellhase.*]—*Ibid.* March 31st. 110-111. 1176

I. SCHELLHASE replies to statements made by ZARIBNICKY that the peroxidase reaction in human milk was first discovered in 1930 by a Japanese worker. SCHELLHASE points out that in 1908 he investigated the subject of peroxidases in the milk of human beings, cows, goats and mares and evolved various tests for them. He does not agree with ZARIBNICKY that the positive reaction always given by cow and goat milk to the test described by the Japanese worker is due to the fact that cows and goats are able to build up vitamin B in the rumen, since he has always observed positive reactions with milk from sows and bitches.

II. In reply, ZARIBNICKY points out that the problem of peroxidases is far from solved. With various reagents as well as with tincture of guaiacum he found that the peroxidase content of human milk varied and could be divided into four kinds. The presence of vitamin B seems to be of some importance.—B. CINADER.

LADELL, W. S. S. (1945.) *Thermal sweating.* —*Brit. med. Bull.* 3. 175-179. 1177

The subject of sweating, acclimatization and the composition of sweat in man is reviewed in the light of detailed studies of the subject made during the war. To those interested in the condition in horses in certain tropical countries known as "dry sweating" or "non-sweating", and in the acclimatization of European cattle in tropical areas, this article is of considerable value.

thiamine, riboflavin, nicotinic acid and pantothenic acid content of colostrum and milk of the cow and ewe.—*J. Nutrit.* 31. 51-57. 1174

The milk and colostrum of the ewe were found to be much richer in vitamin B<sub>1</sub>, riboflavin and nicotinic acid than the milk and colostrum of the cow. In both species the colostrum contained more vitamin B<sub>1</sub> and riboflavin than the milk. In the cow, colostrum and milk contained similar amounts of nicotinic acid, but in the ewe the milk was twice as rich in this constituent as the colostrum. The milk of both species contained more pantothenic acid than the colostrum.

—E. M. CRUICKSHANK.

The stimulus to sweating is a combination of a raised skin temperature and a rising rectal temperature, both probably acting centrally. In the unacclimatized the rectal temperature may rise considerably before the onset of sweating.

Under experimental conditions nude subjects may lose as much as 8 litres of sweat in a four-hour period without working.

For short periods the sweat glands may pour out sweat at the rate of 60-70 ml. per minute. The rate of sweating falls off with time. The decrease is not due to dehydration but may be due to fatigue of the sweat glands. Pathological reduction of sweating occurs in heat stroke. Cessation of sweating results in the complete inability of the body to maintain thermal equilibrium and hyperpyrexia occurs, with a rectal temperature of 110°F. or more.

In a hot wet climate with not much wind only a small proportion of the sweat excreted may be evaporated. With acclimatization sweating starts at a lower rectal temperature and the sweat rate increases. This, it is suggested, may result from hypertrophy of the sweat glands.

The composition of sweat under varied conditions is discussed. Under usual tropical conditions man requires a daily intake of 25-30 g. of salt to replace loss of sodium chloride. Vitamin losses in the sweat are negligible, except for nicotinic acid.—M. C.

MOLNAR, G. W., TOWBIN, E. J., GOSSELIN, R. E., BROWN, A. H., & ADOLPH, E. F. (1946.) *A comparative study of water, salt and heat exchanges of men in tropical and desert environments.*—*Amer. J. Hyg.* 44. 411-433. [Authors' summary copied verbatim.] 1178

Field studies in the California desert and the Florida tropics showed that the thermal stress in the desert is about 2 to 3 times greater than in the tropics. A tropical jungle-swamp, however,

may exert a stress similar to that of the desert shade.

Average 24-hour fluid intakes and sweat outputs were about two times greater in the desert than in the tropics, but the average urinary volume and urinary salt excretion were the same in both environments. Thus men increased their water and salt intakes in proportion to increased losses.

Evaporative losses were correlated with solar intensity and dry-bulb temperature, but no correlation could be shown with relative humidity, air movement, or rectal temperature. Clothing diminished evaporative loss by about 100 grams per hour. In the tropics, about 72 per cent of the heat due to work was lost by evaporation, but in the desert all of this heat must be lost by evaporation.

WRIGHT, H. P. (1945.) **The adhesiveness of blood platelets in rabbits treated with dicoumarol.**—*J. Path. Bact.* 57. 382-385. 1179

Dicoumarol was administered to full-grown rabbits orally (1 mg. per kg. body weight) or intravenously (0.05 mg. per kg.) daily for seven days. By the seventh day the prothrombin time had been roughly doubled and the stickiness of the platelets was much diminished. By the 14th day the prothrombin time and the stickiness of the platelets had returned to approximately normal. Throughout the experiment there was no significant change in the number of circulating platelets. The reduction in adhesiveness of the platelets appears to be related to an interference with some stage of blood coagulation, possibly prothrombin formation.—H. S. McTAGGART.

MILLER, A. T., Jr. (1946.) **Blood volume changes following acute hemorrhage.**—*Univ. N. Carolina Studies in Science.* pp. 175-182. Chapel Hill: University of North Carolina Press. [Author's summary copied *verbatim*.] 1180

Immediately following acute, sub-lethal hemorrhage there is a rapid influx of protein-poor fluid which restores approximately 40 per cent of the lost plasma. This rapid phase of hemodilution, which is complete in 40 to 60 minutes, is checked by the resulting protein dilution, and little further fluid gain occurs during the next 2 or 3 hours. With the beginning of protein mobilization 4 to 6 hours after hemorrhage there begins the slow phase of hemodilution which lasts 24 to 72 hours and results in a final fluid gain approximately equal to the volume of both cells in plasma and lost hemorrhage. With the beginning of red cell restoration some days later, there is a concomitant decline in plasma volume, so that the total blood volume is maintained at a normal level.

During the first few hours following hemorrhage, the mobilization of plasma protein is

negligible, so that protein dilution gives a fairly accurate indication of the degree of hemodilution. On the other hand, changes in hematocrit cell volume frequently give grossly misleading impressions of both the magnitude and direction of blood volume changes.

PLISKE, E. C. (1946.) **The rôle of the fibroblast in acute inflammatory reactions with reference to phagocytic exudate cells.**—*Univ. N. Carolina Studies in Science.* pp. 183-194. Chapel Hill: University of North Carolina Press. [Author's conclusions copied *verbatim*.] 1181

The fibroblasts of loose connective tissue can be stimulated to produce phagocytic exudate cells.

The number of fibroblast-derived phagocytes in inflammation appears to be small as compared to the large number of macrophages derived from blood lymphocytes, monocytes and tissue clasmocytes.

There is little evidence that fibroblasts are able to produce granular leucocytes or any other cell types in inflammation other than phagocytes.

The period of greatest fibroblast activity in phagocyte production appears to coincide with the period in which large numbers of mononuclear leucocytes leave the vessels and hypertrophy to phagocytes.

Connective tissue smear preparations are a helpful adjunct to sectioned and spread preparations in following cellular transitions during the highly cellular stages of inflammation.

FERGUSON, J. H. (1946.) **Dark-field microscopy of surface phenomena in phospholipid films and in formed elements of blood and bone-marrow.**—*Univ. N. Carolina Studies in Science.* pp. 148-156. Chapel Hill: University of North Carolina Press. [Author's summary copied *verbatim*.] 1182

A comparison of the dark-field microscopical appearances of (a) water-phospho-lipid (cephalin, lecithin, and similar) films and (b) in vitro surface alterations of platelets, thrombocytes, megakaryocytes and certain erythrocytes, indicates the fundamental importance of "myelin figures" and related changes at water-lipid interfaces for the explanation of these primitive protoplasmic "membrane" phenomena. The most important factor is the hydrotropism of the lipoidal material. Individual differences between the lipids studied point to a special significance of phosphatidyl ethanolamine (cephalin) in the natural formed elements. The water effect is undoubtedly modified by the osmotic strength and specific ionic properties of dissolved electrolytes (especially  $\text{Ca}^{++}$ ) and probably also by cholesterol, proteins and other materials entering into the formation

of cell "membranes". The full significance of these modifications remains to be elucidated.

KNISELEY, M. H., ELIOT, T. S., & BLOCH, E. H. (1945.) **Sludged blood in traumatic shock. I. Microscopic observations of the precipitation and agglutination of blood flowing through vessels in crushed tissues.**—*Arch. Surg., Chicago*. 51. 220–236. [Abst. in *Trop. Dis. Bull.* 43. 631, copied *verbatim*. Signed:—B. G. MAEGRAITH.] 1183

This paper contains a further report on the direct microscopic examination of blood and small vessels in living frogs and mammals, under normal conditions and following damage by crushing, and also in Stage III of acute *P. knowlesi* malaria in monkeys.

Under control conditions the authors observed that circulating red cells travel free inside the vessels and do not agglutinate, and that white cells do not stick to the vessel endothelium.

In Stage III of *P. knowlesi* infection, a thick glassy precipitate forms between and around the red cells, the precipitate forming simultaneously in about 20 minutes throughout the whole body. The precipitate binds the cells together in "wads and masses (*not rouleaux*)", the circulating blood coming to resemble "sludge". This sludge resists its own flow through the small vessels, so that "stagnant anoxia" develops, the affected endothelium ultimately allowing fluid to leak into the tissues, with steady loss of intravascular fluid volume. Anoxia of the endothelium, alone, is sufficient to cause this. The red cells in *P. knowlesi* infection are not sticky to the endothelium, but are apparently sticky to the phagocytes of the liver, bone marrow and spleen, which readily ingest them, so contributing towards the malarial anaemia.

The authors consider the precipitate to be fibrin or something similar to it, and devised experiments to observe the effect of the introduction of freshly-formed fibrin into the circulation. For this purpose they observed the behaviour of blood cells and vessels in living animals after crushing trauma of various degrees, first in the omentum and then in muscle. They found that after crushing there were, in general, three regions of injury:—

(a) A zone in which small vessels are thrombosed; no sludge is poured into the venous system. (b) A "sludging zone", in which each venule pours out sludge into the general circulation, such out-pouring going on for long periods. (c) A zone in which there is insufficient injury to cause any detectable change in the circulating blood.

The authors conclude that "when they are crushed striated and smooth muscles release

substances capable of diffusing in through the vessel walls and reacting with constituents of the blood flowing through the patent vessels".

[This important paper should be read in the original by those who are interested in the vascular phenomena associated with shock-like conditions.]

BRAUDE, R., & FOOT, A. S. (1946.) **Green food and the pregnant sow. Effect of feeding green food to the pregnant sow on the incidence of piglet anaemia.**—*Vet. J.* 102. 71–73. 1184

Two groups of pregnant sows confined indoors were given a ration of "wheatfeed", barley meal, ground oats, fishmeal and minerals, including ferric oxide. One group received this diet only: the other received in addition 7 lb. of marrow stem kale per sow per day. Estimation of haemoglobin in the blood of the sows at intervals during gestation revealed no subnormal values, nor were they consistently influenced by the consumption of the kale. In all piglets, including those whose mothers had been given marrow stem kale, the haemoglobin fell to a dangerously low level. Direct administration of iron pyrophosphate to the piglets caused a very rapid rise in haemoglobin values.—E. M. C.

DUCKWORTH, J. (1946.) **A statistical comparison of the influence of crude fibre on the digestibility of roughage by *Bos indicus* (zebu) and *Bos taurus* cattle.**—*Trop. Agriculture, Trin.* 23. 4–8. 1185

A statistical study of American and Indian data was made on the influence of crude fibre on the digestibility of organic matter in roughage. The coefficient of digestibility of a feeding stuff expresses a relation between the material under examination and the class of stock to which it was fed. As the European cattle were consuming temperate zone fodders and the Indian cattle were consuming tropical fodders comparison of results was difficult. The correlation between crude fibre and organic matter digestibility was, however, highly significant and negative for both classes of stock.—J. S. S. INGLIS.

DUBLIN, W. B. (1946.) **Reticulum.**—*Arch. Path.* 41. 299–318. 1186

This article describes a method for demonstrating reticulum, the histogenesis of reticulum, its distribution in various pathological conditions and its significance in diagnosis. The method used to demonstrate reticulum is a slight modification of the well-known methods of Maresch, Perdrau, Laidlaw, Foot and Masson. The essential stages include formalin fixation, paraffin embedding, treatment with  $\text{KMnO}_4$  and oxalic acid, immersion in silver nitrate, ammoniacal silver nitrate, formalin, gold chloride, oxalic acid and sodium thiosulphate. Sections can be

counterstained with thionine or cresyl violet, or with light green, ponceau 2R and orange G.

D. considers that reticulum can originate from a variety of cells—reticular cells, histiocytes, monocytes, lymphocytes, vascular endothelium, muscle (smooth and striated) and fibroblasts. Reticulum is precollagen: it does not connect directly with the cell bodies.

The character and distribution of reticulum in the various granulomata are not of much value in differential diagnosis. It is in the study of neoplasms that the demonstration of reticulum is of particular value. Intercellular reticulum is present in considerable amount in the various types of sarcoma and in endotheliomas. No appreciable amount is present in tumours of neurogenic origin, or in carcinomas (including seminoma, granulosa cell tumour, epithelial portions of mixed tumours and tumours of the anterior lobe of the pituitary). The various tumours of mesenchymal origin arising in lymphoid tissue contain reticulum in abundance and distributed indiscriminately. The reticular pattern varies among tumours of the same type and from one field to another and should not be relied on as the sole feature for making a diagnosis. The distribution of reticulum in granulomas and various tumours is illustrated by 12 photomicrographs. The method used to demonstrate reticulum is described in great detail and the various stages in the process are explained: it is claimed that the procedure is simple and reliable and is suitable for routine use.—E. G. WHITE.

**BADENOCH, A. W. (1945.) Descent of the testis in relation to temperature.—*Brit. med. J.* Nov. 3rd. 601-603. 1187**

With a few exceptions such as the whale and the elephant, descent of the testis occurs in all mammals. It has now been established beyond question that the lower temperature of the scrotum is necessary for spermatogenesis, since the experimental withdrawal of the testis into the abdomen or the application of heat to the scrotum leads to the total disintegration of the germinal epithelium.

In 80 observations of the human being the average scrotal temperature was 2-2°C. lower than the temperature of the iliac fossa.

It is suggested that the descent of the testis is a true migration in search of a lower temperature.—J. A. NICHOLSON.

**STEVENSON, W. G. (1946.) The effect of sunlight on the initiation of sexual activity in ranch mink.—*Canad. J. comp. Med.* 10. 137-142. 1188**

Observations were made at a commercial mink ranch located in an open field, which was not shaded. The mink were of the so-called

Eastern type and were confined to wire pens with a nest box at one end. During six years of observation no change was made in the management. The ration was formulated by nutritionists and only minor changes were made from year to year.

It was found that the number of hours of sunlight in February did not have appreciable effect on the number of female mink that mated on or before March 10th in any given year.

—P. J. G. PLUMMER.

**BENOIT, J., & OTT, L. (1944.) External and internal factors in sexual activity. Effect of irradiation with different wave-lengths on the mechanisms of photostimulation of the hypophysis and on testicular growth in the immature duck.—*Yale J. Biol. Med.* 17. 27-46. 1189**

By exposing immature male ducks to light of different wave-lengths for equal periods of time and assessing the stimulation of gonadotropin secretion by measuring the silhouette area of the testes, the authors found that the curve relating the wave-length to activity rose gradually through the blue-green end of the spectrum to a peak in the red band. The curve of the testicular response to light of different wave-lengths may be the result of differences of sensitivity of nervous centres, photoreceptors and stimulators of the anterior hypophysis, as revealed by the quartz rod experiments here described, and may be a curve of absorption of those radiations by the interposed tissues. The absorption factor limits more and more the photostimulation of the receptors and consequently the testis growth, in proportion to the decrease in the wave-length of the radiation (or to the increase in frequency).—N. J. SCORGIE.

**ANON. (1945.) Pituitary stimulation by light.—*Brit. med. J.* Nov. 17th. 695-696. 1190**

BENOIT & OTT [see abst. preceding] found that the curve relating the wave-length to activity closely resembled that of normal light sensitivity in birds, but since light stimulation was still effective when the eyes were removed or the optic nerves were cut, it is concluded that light is probably effective through the retina and certainly effective by direct transmission through the tissues of the duck's head. These tissues were found to transmit orange and red light, but very little blue or green light. This differential tissue penetration in birds may not be present in mammals.—E. C.

**CLARK, W. E. LE G. (1946.) Anatomical problems relative to the traumatic surgery of muscle.—*Bull. War Med.* 6. 267-278. 1191**

Clinical experience of traumatic injuries of muscle has indicated and experimental work on vascularization of muscles has demonstrated that though more than one artery may enter a muscle,

the intramuscular capillary anastomoses, which are undoubtedly present, are very fine and each main vessel of supply may be regarded functionally as an end artery. The significance of this to the incidence of muscle infection following injury is stressed as is the importance of determining types of intramuscular patterns.

In a series of experiments on the tibialis anterior of the rabbit, the area of muscle devascularized by ligation of one of its arteries remained ischaemic for two days and effective revascularization was not established for about a week. The muscle fibres involved underwent necrosis but regeneration occurred following this aseptic necrosis, within a matter of weeks. The connective tissue elements remained to preserve the general fascicular architecture and new muscle fibres grew from the stumps of the surviving fibres along and between this connective tissue framework.—C. W. OTTAWAY.

KRIEG, W. J. S., & GROAT, R. A. (1944.) **Topography of the spinal cord and vertebral column of the cat.**—*Quart. Bull. Northw. Univ. (med.)* 18. 265-268. 1192

As an aid to localization of nerve roots and spinal cord segments in the living cat, measured drawings of the intact vertebral column and of the exposed spinal cord within the neural canal were prepared from a specimen fixed to avoid tissue shrinkage or swelling. The drawings are shown against a cm. scale which can be compared with the level of transverse lines drawn through the highest points of the spinous processes and the centre points of the intervertebral discs.

The following points are made: it is possible to identify the spine of the seventh lumbar vertebra as being in line with the highest points of the iliac crests and from this to identify those of the other lumbar and last two thoracic vertebrae; ganglia

are situated at the intervertebral foramina as far down as the fourth lumbar, from whence they are drawn into the canal; the level of inter-root segments by no means corresponds with the level of their respectively numbered vertebrae.

—C. W. OTTAWAY.

\*MATICS, S. (1948.) Die chemische Reaktion des Scheidenschleimes bei gesunden, kranken und brünstigen Rindern. [**Chemical reaction of vaginal mucus in healthy and diseased cows and in cows in oestrus.**]—*Inaug. Diss., Budapest.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 3rd. 80. (1944).] 1193

The hydrogen ion concentration of the vaginal mucus in healthy cows in oestrus was 7.64-8.14 and in healthy cows not in oestrus, 5.78-8.30. In cows with vaginal and uterine catarrh it was 6.46-8.59.—E. M. CRUCKSHANK.

LEISEN, L., BOST, R. W., & CAMERON, F. K. (1946.) **The importance of molecular structure in wetting agents.**—*Univ. N. Carolina Studies in Science.* pp. 1-7. Chapel Hill: University of North Carolina Press. [Authors' conclusions copied *verbatim*.] 1194

From the foregoing discussion and the experimental results recorded, the following conclusions may be drawn:

1. In the interface, it may be assumed that the hydrophobic portions of the molecules of a wetting agent are dispersed as a colloid, although the hydrophilic grouping may be in true solution.

2. The effectiveness of a wetting agent is determined by its molecular structure.

3. The position and arrangement of groups in a molecule are no less important than their presence, in determining the effectiveness of a wetting agent.

## POISONS AND POISONING

FIELD, H. I., & EVANS, E. T. R. (1946.) **Acute salt poisoning in poultry.**—*Vet. Rec.* 58. 253 & 254. 1195

Mortality occurred on a farm amongst turkeys, fowls, pheasants and bantams and was considered to be due to the ingestion of brine spread on the ground and around fruit trees after the salting of pork. Five out of 12 birds in one pen died and four out of 41 birds in another pen; all birds in a third pen not having access to the salt remained normal. The brine residue taken from the pens was found by analysis to contain 60.8% pure sodium chloride. The symptoms of affected birds and the findings P.M. in those which died, are described.—J. D. BLAXLAND.

BERTONÈCHE, M. (1944.) Intoxication des volailles par le chlorure de sodium. [**Salt poisoning in fowls and ducks.**]—*Rec. Méd. vét.* 120. 152-153. 1196

Eleven out of 29 fowls and ducks died after having been fed on a mash which on subsequent chemical analysis was found to contain 4.8% sodium chloride. The symptoms and findings P.M. in the affected birds are described.—J. D. B.

BRITTON, J. W., & GOSS, H. (1946.) **Chronic molybdenum poisoning in cattle.**—*J. Amer. vet. med. Ass.* 108. 176-178. 1197

Excessive amounts of molybdenum were found in the forage and viscera of affected cattle

in a localized area of Kern County, California. Some symptoms of the disease, as observed in the field, were reproduced by administering daily doses of sodium molybdate to a heifer calf.—H. P.

TELFORD, H. S., & GUTHRIE, J. E. (1946.) **Effects of oral dosages of DDT on certain vertebrates.**—*J. econ. Ent.* **39**, 413. 1198

A single dosage of 1.5–3.3 g. D.D.T. per kg. body weight to goats gave rise to tremors of varying severity, with recovery. Higher dosages resulted in tremors, convulsions, prostration and death within two weeks. Goats fed 0.25–0.28 g. per kg. lost condition and weight and had other symptoms, but recovered when dosage ceased. A kid nursed by a milk goat receiving 1 g. daily developed normally without symptoms of intoxication.

Poultry tolerated a single dose of 0.5 g. per kg. without any ill effect, but all birds fed on a mash containing 0.1% D.D.T. died within ten days with typical symptoms of D.D.T. poisoning. 40% of birds fed on mash with 0.1% dichlorodiphenyldichloroethane (D.D.D.) died without any symptoms.—T. SPENCE.

KONST, H., & PLUMMER, P. J. G. (1946.) **Studies**

**on the toxicity of DDT for domestic and laboratory animals.**—*Canad. J. comp. Med* **10**, 128–134. Discussion pp. 135–136. 1199

Experiments with a commercial brand of D.D.T. revealed that toxicity was lower in large domestic than in laboratory animals. Higher toxic levels were obtained in the latter by oral administration than by subcutaneous injection. Rats had the greatest susceptibility and g. pigs and pigs the least, with mice, rabbits, chickens, cattle, goats and sheep intermediate in increasing order of resistance. Feeding D.D.T.-dusted cabbage leaves and sprayed apple parings to rabbits, g. pigs and rats did not produce toxic symptoms. Flies knocked down by a 4% D.D.T. spray had no effect when fed to chickens. The daily dosage of each bird ranged from 5 to 25 flies and was given for 13 days. Gross pathological changes after large single doses occurred mainly in the liver. No gross changes were observed in the chronic toxicity tests. Histopathological findings were similar in the acute and chronic toxicity tests, there being only a difference in severity. The most constant lesion was a degeneration of the liver, of variable character, but usually a vacuolar degeneration of the cytoplasm of the cell.—R. G.

## PHARMACOLOGY AND THERAPEUTICS

GRAF, H. (1948.) **Pharmakologische Probleme in der operativen Tiermedizin. [Pharmacological problems in veterinary surgery.]**—*Festschrift Oskar Bürgi*, 1948, pp. 139–157.

Horgen-Zürich: Fritz Frei. [In German.] 1200

This article surveys the applications of pharmacology to the field of veterinary surgery. The subject is dealt with under three headings:—induction of narcosis or anaesthesia, the antiseptic treatment of the operation site, and the post-operative treatment of surgical wounds. No experimental work is dealt with and the article does not lend itself to a short summary.—E. G. W.

— (1946.) **Nuclear physics in medicine.**—*Lancet*, **251**, 92–93. 1201

For security reasons the proper discussion of the medical applications of discoveries involving nuclear physics was precluded during the war period. There appear to be three main directions, with numerous ramifications, of the lines of progress likely to give results of the highest importance affecting problems of disease.

(1) These consist of technical achievements such as the cyclotron, linear electron accelerators and the betatron, the latter with an X-ray beam which gives a higher dose in the tissues than in the skin through which it passes. The study of

the neutron beam from the cyclotron and methods of controlling the electron stream to yield a pure  $\beta$ -ray beam are suggested as promising fields of investigation; (2) the use of radioactive isotopes for elucidating problems of physiology and in studies of the metabolism of chemical substances in the body and chemical reactions within the cells. The advances in this line are likely to be rapid as soon as radio-active materials are available in sufficient quantities in this country; (3) experimental and clinical research on cancer using tracer methods. Already information is available about the metabolism of the different nucleotides in normal and in tumour cells. A possibility of great interest is the substitution for radium of radioactive cobalt from which a constant output of  $\gamma$ -radiations can be obtained. There are hopes that by this substance a mass unit may be constructed giving radiations of five times the intensity of the radium beam units at present available.

—A. EDEN.

LEGGE, J. W., & DURIE, E. B. (1942.) **The antagonism between procaine and the sulphonamides.**—*Med. J. Aust.* Dec. 26th, 561–565. 1202

An esterase in human blood causes procaine to be hydrolysed to *p*-aminobenzoic acid. In mice

hydrolysis also occurs, some of the *p*-amino-benzoic acid undergoing acetylation. The authors found a slight increase in mortality in experimental streptococcal septicaemia of mice controlled by sulphonamides if procaine were injected.

—D. A. TITCHEN.

— (1946.) **Fluids in heart-failure.**—*Lancet*. 251. 54. 1203

Most of 64 patients with congestive heart failure benefited by a strict adherence to a diet containing 700 mg. of sodium in an amount of food equivalent to 1,800 calories, with unlimited fluids. Such a diet is extremely dull and in view of its unsatisfactory psychological effect it is usually better to restrict sodium as much as is compatible with an attractive diet, to restrict fluids moderately to give as much protein as the patient can digest and to prescribe rest, digitalis and mercurial diuretics.—R. MARSHALL.

— (1946.) **The use of penicillin in veterinary practice. A general review of the position at 1st August, 1946.** pp. 17. Manchester: I.C.I. Limited. fcp. mimeographed. 1204

Most of the reports which are summarized here are of American origin, as penicillin was released for general use in veterinary practice in America early in 1945, before it became generally available in GREAT BRITAIN. The summary will prove of great value to the practitioner as it gives much information not easily obtainable on the results of field trials with penicillin against diseases in animals, and names the conditions in which penicillin either has been reported as having, or likely to have, beneficial results and those against which it is ineffective. An account is given of the solubility of penicillin, of the preparation of dilutions for immediate use and of the distribution of penicillin in the body after its administration by various routes.

In cattle, the condition in which the action of penicillin has been most investigated is mastitis: a useful table summarizes the various doses and time intervals that have been used for udder infusion. In general, bacteriological cures appear to have been obtained in 75–80% of cases due to *Str. agalactiae*, but the results are less favourable in cases of staphylococcal infection. It is thought that penicillin may prove to be an effective agent against mastitis due to *Corynebact. pyogenes*, the suggested dosage being 100,000 units by udder infusion, repeated if necessary.

Treatment of actinomycosis is promising, using either parenteral doses of 1,000–5,000 units per 5 lb. body weight repeated 2–3 times daily for several days, or, more economically, direct injection into the lesion of 200,000–800,000 units, repeated if necessary after a few days. *A. lignierisi*

infection, being due to a Gram-negative organism, is thought unlikely to respond to penicillin treatment. Penicillin is effective against the anthrax bacillus, and the drug might be useful in a herd in which a case has occurred if given to animals with a temperature rise (intravenous or intramuscular doses of 1,000–5,000 units per 5 lb. body weight, repeated at six-hour intervals if required). Although penicillin is effective against *Cl. chauvoei*, treatment of blackleg cases (with 100,000–200,000 units intravenously) has given variable results. Penicillin may be used in *Fusiformis necrophorus* infections, e.g., by parenteral doses in calf diphtheria and local injections (50,000–100,000 units) in “foul in the foot”. Beneficial results have also been reported in cases of haemorrhagic septicaemia, retained placenta (100,000 units in capsule into uterus), *C. renale* infection (300,000 units intramuscularly every four hours until clinical recovery), and anaplasmosis (100,000 units, repeated in 24 hours).

In the horse, satisfactory results have been reported in cases of strangles (100,000 units intramuscularly every four hours, 5–9 doses being required) and combined penicillin and sulphonamide therapy is claimed to give rapid recovery. Although *Cl. tetani* is susceptible to penicillin, it is doubtful whether penicillin can be employed practically in the field against tetanus. *C. ovis* infection (ulcerative lymphangitis) should prove amenable to penicillin treatment. Good results have been reported to follow the injection of 200,000 units into and around unopened pus pockets in fistulous withers cases. It is suggested that the drug may be worth trying in cases of acne, being given parenterally, or injected directly into the pustules.

In sheep and goats, the effect of penicillin might be tried in the following conditions: arthritis due to *E. rhusiopathiae*, lamb dysentery, struck or blackleg and pseudotuberculosis (the difficulty of clinical detection of this disease makes it doubtful however if penicillin will be of any practical value).

In pigs, the chief potential use is in cases of swine erysipelas (a suggested dose is 1,000–2,000 units per 5 lb. body weight, given intramuscularly, and repeated at six-hour intervals).

The chief indications in dogs appear to be the infections secondary to canine distemper (a dosage of 10,000–20,000 units intramuscularly or intravenously about every six hours has been effective), leptospiral jaundice (repeated doses of 10,000–20,000 units are suggested), haemolytic streptococcal infections and skin diseases such as pustular dermatitis. Parenteral injection of 2,000–5,000 units has been reported to be effective in the treatment of sinus infection in cats. The

direct injection of a few thousand units into interdigital cysts might be tried, with systemic dosage in recurring cases. Penicillin has also been used successfully in the treatment of acute diffuse peritonitis in dogs and in canine piroplasmosis, and its use is suggested in cases of pyometra in dogs and cats.

Many other conditions may provide indications for the use of penicillin as further field trials are made.—E. COTCHIN.

FREI, W. (1943.) Schädigung von Bakterien durch Angriff auf ihr Oxydationssystem, nebst Bemerkungen zur Chemotherapie. [**Damage to bacteria by interference in their oxidation system, in its relation to chemotherapy.**]—*Festschrift Oskar Bürgi*, 1943, pp. 123-138. Horgen-Zürich: Fritz Frei. [In German.] 1205

Experiments were carried out on the effects of various agents on bacterial dehydrases. When washed suspensions of *Bact. coli* were heated to 55-60°C. considerable destruction of bacterial dehydrase occurred, the effect being more marked on the succinyl dehydrase than on the glucose dehydrase. Exposure to ultraviolet light caused partial destruction of the enzymes. Using *Br. abortus* and *Bact. coli* it was found that very low concentrations of copper sulphate or cobalt sulphate (2.5-12.5  $\gamma$  %) caused severe damage to glucose dehydrase: it is considered unlikely, however, that these salts would exert a similar effect *in vivo* because of the presence of proteins. In contrast, moderate concentrations of heavy metals exerted a stimulating effect on dehydrase activity. The effect of formaldehyde, acetaldehyde and ethyl alcohol varied with the thickness of the suspension used; stimulation occurred with thick suspensions and inhibition with thin suspensions (more reagent per organism).

In 1941, F. found that cibazol [sulphathiazole] was effective in controlling infections in mice caused by *Past. aviseptica* whereas no effect was obtained in infections with *E. rhusiopathiae*. *In vitro* experiments confirmed this finding, since cibazol was found to inhibit glucose oxidation caused by *P. aviseptica* whilst having no inhibitory effect or even a slight stimulating effect on *E. rhusiopathiae*. With a much lower concentration of the drug the dehydrase activity of *Past. aviseptica* was also stimulated. A concentration of cibazol which inhibited the pasteurella stimulated the activity of *Erysipelothrix*. The concentration necessary to inhibit the metabolism of *Pasteurella in vitro* (0.005-0.017%) was lower than that required in the living animal, a finding which indicates the inadvisability of assuming that levels of chemotherapeutic agents which are effective against organisms *in vitro* will be equally effective *in vivo*.—E. G. WHITE.

PIERRE, M., & GODFRAIN, J. C. (1944.) A propos de la sulfamidothérapie. [**The sulphonamides and their therapeutical uses.**]—*Rev. Méd. vét., Lyon et Toulouse*. 95. 204-224. 1206

This is a review of the chemotherapy of the sulphonamides. The authors advocate treatment in the early stages of the infection with large doses of the drug and continued dosage to give satisfactory results. It may be advantageous to associate this treatment with other medicaments destined either to hold the sulphonamide at the focus of infection or to complete its bacteriostatic action. The antagonism between *p*-aminobenzoic acid and the sulphonamides is discussed.

—R. MACGREGOR.

ANDREW, R. (1941.) Dosage interval in sulphapyridine administration.—*Med. J. Aust.* Nov. 29th. 612-615. 1207

Evidence is presented indicating that satisfactory blood concentrations can be obtained with dosage at four, 12, or 24 hour intervals. A. concludes that the excretion of sulphapyridine is slower than was formerly believed and emphasizes the importance of this to medical practitioners.

—D. A. TITCHEN.

HOLSTEIN, G., & RICHOU, R. (1941.) L'anatoxine staphylococcique et son emploi dans le traitement des suppurations chez le cheval. [**Anatoxin in treatment of staphylococcus infections in the horse.**]—*Rec. Méd. vét.* 117. 116-125. 1208

The horse has been found to be a favourable subject for treatment with staphylococcus anatoxin and produces abundant antitoxin following the injection of several doses of anatoxin at five-day intervals. Of 60 cases of severe staphylococcus infection treated, 53 were cured. No reaction follows the injections and suppuration rapidly diminishes, frequently after only two inoculations of anatoxin.—S. J. GILBERT.

KREBS, F. (1944.) Über den sogenannten Einschuss der Pferde. [**Lymphangitis of horses (Monday morning disease).**]—*Schweiz. Arch. Tierheilk.* 86. 163. 1209

Exposure to cold, wet conditions and mechanical irritation are contributory causes. Warmth is the first essential in treatment. Camphor ointment and 5% mercurial ointment are still recommended. The use of sulphonamides reduces the severe, acute initial symptoms and prevents or mitigates cases in which there is a high degree of elephantiasis. Soluseptazine injections at intervals of 2-3 days were adopted by K. as standard treatment, with "albatrol" as an effective substitute if soluseptazine was unprocurable. Movement was generally restored to the leg, which was kept blanketed, a few days after injection. The foot should be kept warm for a

further period. Warm fodder beet is a useful laxative.—K. J. SINCLAIR.

HARVEY, P. C., LIBBY, R. L., & WALLER, B. B. (1945.) Oral use of penicillin in treatment of experimental *Erysipelothrix rhusiopathiae* infection in mice.—*Proc. Soc. exp. Biol., N.Y.* 60. 307–309. 1210

50% of mice experimentally infected with *E. rhusiopathiae* survived if treated within 24 hours with penicillin given orally in the water. Penicillin in food or water protected 100% of the animals, when administered simultaneously with the infective dose.—M. L. LEVI.

ZWEIG, J. (1946.) *Ps. pyocyanea*: study in vitro and in vivo of the bactericidal and therapeutic properties of  $\alpha$ -oxyphenazine and a lipoidal product.—*Vet. J.* 102. 55–70. 1211

*Ps. pyocyanea* has been known for many years to have properties antagonistic to various bacteria: three active principles are known, pyocyanin,  $\alpha$ -oxyphenazine and a lipoidal product prepared from dried bacterial bodies or dried whole broth cultures. Details of the preparation of  $\alpha$ -oxyphenazine and the lipoidal substance are given.

In *in vitro* tests,  $\alpha$ -oxyphenazine was found to be active against *Corynebact. pyogenes*, *Vibrio foetus*, *Past. bovisseptica*, *Str. agalactiae*, *Str. dysgalactiae*, *Staph. aureus*, *Br. abortus*, *Bact. coli*, *S. cholerae-suis*, *Cl. welchii*, *Cl. septicum*, *Cl. chauvoei* and *Cl. tetani* in approximately descending order of susceptibility of the organism, while the lipoidal product was active against *B. anthracis*, *Br. abortus*, *Str. agalactiae*, *Str. dysgalactiae* and *Staph. aureus* (human and bovine) and inhibited the growth of *M. tuberculosis* (human). The concentrations necessary to kill the organisms varied with the organism and time of exposure and ranged from 1:1,000 to 1:1,000,000 for  $\alpha$ -oxyphenazine, the lipoidal product being half as active.

In *in vivo* tests of  $\alpha$ -oxyphenazine were made with g. pigs infected with *Br. abortus*, on udders of cows affected with *Br. abortus* and on udders infected with *Str. agalactiae* and *Str. dysgalactiae*. A test dose of *Br. abortus*, which gave 100% infection of controls resulted in only 55% infection when the g. pigs were given 100 mg.  $\alpha$ -oxyphenazine. No toxicity occurred at this strength.  $\alpha$ -oxyphenazine infused into the udder reduced the count of *Br. abortus* in the udder secretion, but the effect was temporary. Infusion into the udder of 50–500 mg.  $\alpha$ -oxyphenazine caused no udder reaction, generally gave marked clinical improvement with temporary great reduction of the count of *Str. agalactiae* and *Str. dysgalactiae* and effected two bacteriological cures.

In *in vivo* tests of the lipoidal product were

made as for  $\alpha$ -oxyphenazine and in addition its effect was tested on TB. in the g. pig. Results were, in general, similar to those obtained with  $\alpha$ -oxyphenazine, but the lipoid gave rise to a reaction in the udder. G. pigs had a milder infection with TB. when protected by the lipoid.

—R. SCARISBRICK.

KURUNG, J. M. (1945.) *Aspergillus ustus*.—*Science*. 102. 11–12. 1212

K. reports the antibiotic activity *in vitro* against *M. tuberculosis* of an extract of a strain of *Aspergillus ustus*. The mould grows well on Czapek-Dox medium to which has been added 4% glucose and 0.1% Bacto-Yeast. The optimum temperature appears to be 28°C. for production of the inhibitory substance, which can first be demonstrated on the sixth day of culture. It can be extracted by various solvents including ether. The ether extract is a light yellow residue insoluble in water.

Potency tests after 30 days' incubation of *M. tuberculosis* revealed complete inhibition in dilutions varying from 1:200,000 to 1:400,000. Different batches of the ether extract varied in potency. Controls showed a heavy growth at the end of 30 days incubation. *M. ranæ* was inhibited to the same extent as the tubercle bacillus. There was only slight activity against *Staphylococcus* and *Streptococcus* and none against *Bact. coli*. The active agent was stable and relatively non-toxic: 6–8 mg. was tolerated by a mouse. Methods of purifying the extract are being studied before attempts are made to assess its value in experimental TB.—D. LUKE.

BOSE, S. R. (1946.) Antibiotics in a polyporus (*Polystictus sanguineus*).—*Nature, Lond.* 158. 292–296. 1213

*Polystictus sanguineus*, a higher fungus which grows on decomposing wood in India, when grown in culture medium exhibits antibiotic activity against *Staph. aureus*, *Str. pyogenes* (human), *Str. viridans*, *S. typhi*, *S. paratyphi A* and *B*, *Bact. coli*, *Bact. flexneri* and *V. cholerae*. B. summarizes his earlier work on the subject.

The crude culture-filtrate (polyporin) protects g. pigs against *V. comma*, and *S. typhi* and against the local reaction and fever caused by typhoid vaccine. It is non-toxic to g. pigs. *Staph. aureus* and streptococcal infections, the typhoids and cholera have been treated in man with some success.

The active principle is stable to heat, to pH in the range 2–8, to gastric juice (can be taken orally), is non-volatile, ether-soluble and stable for some time at room temperature.—R. S.

WOODRUFF, H. B., & FOSTER, J. W. (1944.) *In vitro* inhibition of mycobacteria by strepto-

thricin.—*Proc. Soc. exp. Biol., N.Y.* 57. 88–89. 1214

Streptothricin proved bacteriostatic against tubercle bacilli (*M. hominis*, *M. leprae* and *M. smegmatis*) in Long's medium in concentrations of 0.1–1.0 unit per ml. and bactericidal against the same strains in concentrations of 8.0 units per ml. Streptothricin deserves detailed *in vivo* testing in the therapy of TB.—ALEX. B. PATERSON.

HEILMAN, D. H. (1945.) **Cytotoxicity of streptomycin and streptothricin.**—*Proc. Soc. exp. Biol., N.Y.* 60. 365–367. 1215

Streptomycin tested on tissue culture preparations of rabbit spleen appeared to be relatively non-toxic to wandering cells and fibroblasts. Streptothricin was toxic to fibroblasts, but not to leucocytes and macrophages.—E. BOYLAND.

WEST, M. G., & EDWARDS, P. R. (1945.) **Inhibition of *Salmonella* cultures by streptomycin.**—*Proc. Soc. exp. Biol., N.Y.* 60. 363–364. 1216

Tests of the *in vitro* inhibition of 412 cultures of *Salmonella* by streptomycin showed that *S. paratyphi A* and *S. typhi* were the most sensitive. All cultures were inhibited by concentrations of 32 units per ml. medium.—E. BOYLAND.

MULLEN, F. E. (1946.) **Sulfamerazine as a prophylactic in pullorum disease in poults.**—*J. Amer. vet. med. Ass.* 108. 163–164. 1217

Newly hatched poults from seven pullorum-infected flocks were fed for five days on a mash containing 0.5% sulphamerazine. There was an average difference in mortality of almost 14% between the treated and untreated groups. In four other cases where control groups were not available, the total average loss was 4.1%. When feeding of the treated mash was continued for longer than five days, litter eating became widespread thus causing further losses. [M. was presumably not concerned with the possibility of "carriers" amongst the treated poults when they attained maturity. He makes no reference to the likelihood of this occurrence.]—J. D. BLAXLAND.

VAN SACEGHEM, R. (1940.) **Le traitement de la typhose aviaire par l'aminophénylsulfamide.** [Treatment of fowl typhoid with sulphanilamide.]—*Ann. Méd. vét.* 85. 14–16. 1218

The history of sulphonamide therapy is briefly reviewed. In Belgium, "astreptine" [sulphanilamide] was found to have marked action on fowl typhoid. When mixed with water and administered orally for two consecutive days in three 0.3 g. doses to naturally affected fowls, there was a rapid improvement. There was frequently a relapse, but this was cured by the further administration of three similar doses given in one day. Birds inoculated with virulent culture of *S. gallinarum* were all cured in three days by three

0.3 g. doses of "astreptine". All the control birds died.

The author discusses the nature of the antibacterial action of the sulphonamides. He points out that after a cure brought about by sulphanilamide, no immunity to fowl typhoid exists.

—D. S. RABAGLIATI.

MERINO, C. (1945.) **Penicillin therapy in human bartonellosis (Carrion's disease).**—*J. Lab. clin. Med.* 30. 1021–1026. [Author's summary copied *verbatim*.] 1219

Penicillin was employed in the treatment of two patients with bartonellosis (Carrion's disease) during the initial noneruptive period of the illness.

The favorable effects observed clinically in these patients and in the degree of red blood cell parasitism, together with the changes in the morphologic characteristics of the responsible organism in the red blood cells, suggest the desirability of carrying out further studies to elucidate the value of penicillin in the treatment of human bartonellosis.

GEIGER, W., & DRÄGER, K. (1944.) **Die Behandlung der experimentellen Hundestaupe mit Sulfonamiden.** [Treatment of experimental dog distemper with sulphonamides.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 365–370. 1220

Of nine sulphur compounds used to test their chemotherapeutic values against dog distemper, six were sulphonamides of the type sodium sulphanilysulphanilate or substances of similar chemical constitution modified by substitution within the molecule and three were sulphones. Ferrets and dogs were used as the experimental animals and details are given of the tests which were made. The authors conclude that sulphonamides and sulphur compounds have no detectable influence on the distemper virus. They consider that sulphonamide therapy should be of value for minimizing the effect of the secondary infections.—R. A. ROPER.

LYLE, C., & STRONG, R. G. (1945.) **Dusting for cattle lice.**—*J. econ. Ent.* 38. 611–612. 1221

Isolated patches of hair were made by clipping circles around the areas on the neck, flank, legs, etc., of calves. On these patches the numbers of *Trichodectes bovis* and *Linognathus vituli* were counted before and after treatment. 0.5% rotenone and 10% D.D.T. both gave good results, with complete control in two treatments. The amount of dust deposited on the animal was not determined. More successful results were got by blowing the material directly against the animal than by allowing a fine fog to settle from the atmosphere on to the calves. The undersides

should receive particular attention since they are little affected by a settling dust. When small quantities were used, 0.5% rotenone gave better results than D.D.T.—T. SPENCE.

KEMPER, H. E., & ROBERTS, I. H. (1946.) **Preliminary tests with DDT for single-treatment eradication of the swine louse, *Haematopinus suis*.**—*J. Amer. vet. med. Ass.* 108. 252-254. 1222

Pigs infested with *H. suis* were sprayed with 0.1% or 0.5% D.D.T. emulsion. All lice were killed but larvae hatching from eggs were able to re-establish the infestation. Three hundred heavily infested pigs dipped in 0.75% D.D.T. emulsion were freed completely of lice, the drug persisting sufficiently to kill all larvae on hatching.—T. SPENCE.

BRUCE, W. G., & BLAKESLEE, E. B. (1946.) **DDT to control insect pests affecting livestock.**—*J. econ. Ent.* 39. 367-374. 1223

In 1945, four adjacent counties of Florida were subjected to a large-scale insecticidal effort by spraying all the livestock and dairy establishments. The results were similar to those achieved by smaller scale trials in 1944.

Cattle were protected for at least two weeks from *Stomoxys calcitrans* by being put through a wading vat of 2% D.D.T. emulsion and by spraying the resting places of the flies. In some places this fly had been so troublesome that the calves were unable to obtain sufficient milk from their dams. Spraying of cattle sheds with 2.5% emulsions or suspensions gave not less than 88 days effective control of *Musca domestica* and if associated with good manure disposal a single spraying was effective throughout the season. Spraying cattle with 2.5% emulsion at the rate of about one pint per animal was more effective than dipping in 0.2% emulsion and kept down populations of *Lyperosia irritans* for periods of 50 days to the whole season. Treated steers gained on an average 30 lb. more per week than untreated animals. No treatment gave any marked reduction in numbers of Tabanidae. Spraying with emulsions was accompanied by increased irritability and nervousness and was not considered entirely harmless. For the larger scale tests, water-dispersible suspensions were used which did not cause development of such symptoms. In no case was there any injury to the animals.—T. SPENCE.

BRETT, C. H., & FENTON, F. A. (1946.) **DDT as a residual insecticide for fly control in barns.**—*J. econ. Ent.* 39. 397-398. 1224

Complete control of flies in barns for 2-3 weeks was obtained by spraying the walls with D.D.T. dissolved in kerosene, with D.D.T. in wettable powders suspended in water, or by dry

applications of D.D.T. dusts. The duration of control was directly dependent upon the concentrations of D.D.T. used, increased persistence being obtained with increase of concentration. Little control was obtained with 0.2% D.D.T. mixtures, but excellent control was obtained with 5% sprays. The period of control was also extended with a decrease in temperature.—W. M.

SWEETMAN, H. L. (1946.) **DDT as a spot treatment for flies.**—*J. econ. Ent.* 39. 380-381. 1225

D.D.T. fly sprays, to obtain control, need not be applied indiscriminately over extensive areas inside buildings, but only where the flies are observed to collect in numbers and where the accumulation of fly specks marks the favoured resting places. When flies are active about a building they will come into contact with the treated areas in the course of a few hours and the fly population will largely disappear. For this purpose, concentrations of 5-25% D.D.T. in white or odourless kerosenes are recommended. The frequency of application and the areas that should be sprayed vary considerably, depending upon the type of building and the abundance of flies.—W. MOORE.

MATTHYSSE, J. G. (1946.) **DDT to control horn-flies and Gulf Coast ticks on range cattle in Florida.**—*J. econ. Ent.* 39. 62-65. 1226

Spraying cattle in a chute with a many-nozzled power spray was the most practicable method of application, though less effective than dipping. Persistence of insecticide on the animal's coat was greatly reduced by the hot, humid summer climate of Florida, with its almost daily heavy rain, but deposits from suspensions were retained longer than those from emulsions. The most economically effective control was by spraying with 1% D.D.T. suspension, which remained lethal for two weeks and kept fly populations at insignificant levels for a month. Higher concentrations gave an effect only a little more lasting.

Inclusion of 8% D.D.T. in ear salves reduced screwworm infestation of bite-wounds of the Gulf Coast tick, *Amblyomma maculatum*.—T. SPENCE.

HUGHES, L. E., JENKINS, J. R. W., & JONES, J. M. (1946.) **A field trial of D.D.T. and gammexane (666) in the control of sheep myiasis.**—*Vet. Rec.* 58. 251-252. 1227

About 3,000 sheep, divided into groups, and kept under varying conditions in mid-Wales, were dipped in 0.5% D.D.T. emulsion, 1.0% "666" [benzene hexachloride] suspension [gamma isomer content not specified], or a proprietary arsenical preparation, or were left untreated as controls. In an observation period of 33 days, 1.1% of D.D.T.-treated sheep were struck, with

an average protection of 28 days, 1.6% of "666"-treated sheep were struck, with an average protection of 27 days, 3.2% of arsenic-treated sheep were struck, with an average protection of 22 days, and 7.7% of the untreated sheep were attacked. On one farm much longer protection was given by the first two materials, particularly D.D.T.

No harmful effects on the sheep were noted and although the exact mode of protection is not known, D.D.T. and "666" offer better means of control than any used before.—T. SPENCE.

SCHMID, G. (1945.) Beobachtungen über die Wirkung des DDT Geigy (Dichlordiphenyl-trichlormethylmethan) auf Vogelmilbe und Federlinge. [Observations on the effect of DDT on poultry mites (*Dermanyssus avium*) and lice (*Menopon spp.*).]—*Schweiz. Arch. Tierheilk.* 87. 524–526. 1228

In laboratory experiments on the effect of D.D.T. on poultry mites and lice, contact with a concentration of  $\gamma$  ( $\gamma = 0.000001$  g.) per ml. was found to cause death. No field tests are described, but it is stated that the practical effectiveness had been proved.—BERYL A. THURSTON.

LYLE-STEWART, W. (1946.) Sheep maggots and DDT.—*J. Minist. Agric., Lond.* 53. 178–180. 1229

Of 700 lambs dipped in early July in 0.5% D.D.T. emulsion "M.42", two were struck and of a similar group treated with a commercial arsenic-sulphur dip, 14 were attacked in an observation period of six weeks. In another dipping in late August, 2,900 ewes and lambs were dipped in 0.5% D.D.T. emulsion "M.42" and the same number in a proprietary dip. Two sheep in groups treated with D.D.T. developed strikes, while 17 of the control sheep were attacked in a period of seven weeks observation.—T. S.

ENDRIGKEIT, A. (1944.) Versuche zur Wirkungssteigerung von Wurmmitteln. Teil I. Zur Abkürzung des Behandlungsverfahrens beim Allegan. [Experiments in increasing the effectiveness of anthelmintics. I. Shortening the process of treatment with allegan.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 211–215. 1230

The recommended dosage of allegan for the control of small strongyles in horses is three and a half tablets repeated three times at intervals of 6–8 days. E. tested the effects of this technique on the faecal worm egg count and found that it fluctuated greatly, finally becoming and remaining low after the last dose. Worms were voided only to a small extent. When, however, eight tablets were given in a single dose, not only was the egg count markedly reduced, but numerous worms (*Trichonema*) were removed in a temporarily

paralysed though not dead condition. Many oxurids were also removed. Egg counts were very low 14 days after treatment. Large strongyles and ascarids were not removed to an effective extent. [E. was apparently unaware of the anthelmintic use of phenothiazine.]—J. E.

HARBOUR, H. E., MORGAN, D. O., SLOAN, J. E. N., & RAYSKI, C. (1946.) Trials with phenothiazine-salt mixtures for the prevention of parasitic gastritis in lambs.—*J. comp. Path.* 56. 180–195. 1231

The object of this work was to test the value of a phenothiazine-salt mixture as supportive treatment to individual dosing under sheep farming conditions in Scotland.

In a preliminary trial on four groups each of 12 weaned lambs, the ability of a 1:14 mixture to reduce the faecal worm egg count by about 50% was demonstrated, but the pasture infestation as judged by larval counts was not materially altered either in this group or in three others given two doses individually of 20 g. of phenothiazine salt alone, or salt plus mineral mixture respectively.

In the first main experiment three lots of animals each comprising 18 ewes and 36 lambs, were given respectively phenothiazine-salt (1:15); three monthly doses of 10 g., 15 g. and 20 g. of phenothiazine; and ordinary salt. Results were not significant, faecal egg counts rising in all groups, but the phenothiazine groups made better weight gains.

In the final experiment the same technique was used, except that the strength of the phenothiazine-salt was raised after a time from 1:15 to 1:9. Results of faecal egg counts and pasture larval counts were best for the group individually treated and good also in the phenothiazine-salt group.

It was concluded that the value of phenothiazine-salt was of a low order *per se*, as the maximum daily intake of the drug was not over 0.25 g. per sheep, which is only half that which is desirable in this technique. The combined application of individual dosing of lambs on weaning, plus provision of the drug-salt mixture during the summer season is recommended.

—J. E.

I. DOWLING, G. B. (1946.) New remedy for lupus. [Correspondence.]—*Lancet.* 250. 590–591. 1232

II. BICKNELL, F. (1946.) New remedy for lupus. [Correspondence.]—*Ibid.* 717. 1233

I. Discussing the mode of action of calciferol in the treatment of lupus, D. says that the beneficial effect may not be the direct result of the disturbance of calcium metabolism to which large dosage gives rise. He warns against the risk of

hypervitaminosis D<sub>2</sub> which will result from overdosage.

Of 32 cases treated, over half appeared to be cured. Better results have been claimed in France by CHARPY (1943), who in addition to calciferol gave his patients calcium gluconate and supplementary milk.

Estimation of the calcium level in the blood is advised, the occurrence of hypercalcaemia being an indication for interruption of treatment.

II. B. points out that vitamin D poisoning may occur without hypercalcaemia and that clinical observation of symptoms is more useful than estimations of the blood calcium level. The symptoms are described. The risk of serious or lasting injury from overdosage is slight. In cases of personal idiosyncrasy to vitamin D the local application of vitamin D<sub>2</sub> ointment instead of oral administration is suggested.—M. C.

SWYER, G. I. M. (1945.) **Rat-bite fever due to cat-bite. Satisfactory response to penicillin after failure of arsenotherapy.**—*Brit. med. J.* Sept. 22nd. 386-387. 1234

A case of rat-bite fever [*Spirillum* infection] in a man who had been bitten on the finger by a cat is described. The incubation period was about 20 days. Treatment with nearsphenamine was followed by apparent cure after an illness lasting nearly two months. Relapse occurred and the condition finally cleared up following the use of penicillin.

Diagnosis was confirmed by inoculation of mice with blood. Organisms indistinguishable from *Spirillum minus* were present in the blood of the mice seven days after inoculation.—M. C.

MCDONALD, I. W. (1946.) **Effect of BAL-intrav on excretion of copper by the sheep. [Correspondence.]**—*Nature, Lond.* 157. 837. 1235

Intramuscular injection of BAL-intrav solution either in a single dose of 4 g. or in four doses each of 1 g. at intervals over a five-hour period increased the excretion of copper in the urine about 30 times the normal value. With the larger dose excretion reached a maximum during the first hour after injection and fell rapidly during the next five hours. With the smaller repeated doses, high levels of excretion were maintained. The injection caused no apparent deleterious effects and was rapidly excreted in the urine.

—R. ALLCROFT.

MIRSKY, I. A. (1945.) **Alloxan administration to the duck.**—*Proc. Soc. exp. Biol., N.Y.* 59. 35-37. 1236

A single intravenous injection of alloxan caused necrosis of the Islets of Langerhans in the pancreas, but did not produce diabetes mellitus, as in most other species including the pigeon.

Doses of more than 200 mg. of alloxan per kg. body weight caused death of the bird in 3-48 hours, but no constant blood sugar response was observed. Smaller doses did not produce any significant change in blood sugar concentration.

—J. D. BLAXLAND.

HOLM, H. (1943.) **Kliniske Erfaringer ved Behandlingen af Otitis media hos Hunden. [Clinical treatment of otitis media in dogs.]**—*Maanedsskr. Dyrlaeger.* 55. 166-183. 1237

Otitis media is said to be very common and a great number of dogs, apparently with otitis externa, in reality probably have otitis media. The diagnosis of acute otitis media is difficult until after the perforation of the tympanic-membrane.

Most of the cases treated have been of chronic type with complicating otitis externa. In six cases the external auditory meatus was slit, after which it was possible to demonstrate a perforation. H. used the method of douching the cavum tympani in 404 dogs. By means of a rubber ball a chloramine solution (0.2%) or an iodine solution (I<sub>2</sub>, 1 g; KI, 3 g; H<sub>2</sub>O, 1,000 ml.) was injected gently through the external auditory meatus and the tympanic-membrane, whence it flowed to the rhino-pharynx and out of the nostrils. Dogs often swallowed a certain amount of the fluid. If there was no perforation of the tympanic-membrane the injector and the ear-lap were held so that the fluid could run out of the ear. Sometimes the external auditory meatus was so narrow that it is necessary to dilate it for some days by means of tampons. Douching was repeated until suppuration ceased, generally after ten days to 4-6 weeks. In 20 cases douching was followed by complications. Two dogs were totally deaf. Six held their heads in an oblique position for 6-10 days, one did so permanently. One was unconscious for six days but recovered. Ten were deaf for some days but recovered.—H. E. BENDIXEN.

MACRAE, D. E. (1947.) **The use of calciferol in tuberculous conditions.**—*Lancet.* 252. 135-137. [Author's summary copied *verbatim*.] 1238

Calciferol is of the greatest value in the treatment of lupus vulgaris. Local treatment still has a place, both in speeding cure and for cases responding poorly or not at all to calciferol.

Calciferol has so far given promising results in other forms of surgical tuberculosis. Toxicity is present to some extent in 50% of cases and, though usually mild, can cause anxiety. Other disadvantages include the occasional dissemination of tuberculosis and flaring up of a quiescent site elsewhere.

Constant supervision is necessary, particularly in the elderly.

SMYTHE, R. H. (1946.) **Some further notes on the use of stilboestrol dipropionate in canine practice.**—*Vet. Rec.* 58. 75. 1239

Stilboestrol dipropionate is effective against anal adenomata, prostate enlargement due to glandular hypertrophy and small neoplasms of the testicle. For other neoplasms it is less effective. Dosage is 10–20 mg. by subcutaneous injection once a week, 5 mg. *per os* on alternate days or 10 mg. by subcutaneous injection once a week and 2 mg. daily *per os*. Oral administration alone produces uncertain results and oral combined with subcutaneous administration is recommended. Other non-neoplastic conditions successfully treated were pseudo-pregnancy, mésoalliance and chronic dry eczema. Unsuccessful cases were carcinoma, papilloma and simple fibroma, while in adeno-carcinoma only the adenomatous part was resolved. Male dogs evince polyuria and polydipsia after one dose, and later undergo a partial reversal of sex. Old debilitated dogs tend to prostration and collapse after prolonged treatment and the dosage for these should not exceed 5 mg.—R. MACGREGOR.

OPPERMANN, M. (1943.) **Nochmals Sexocretin bei der Bekämpfung der Anaphrodisie der Schafe. ["Sexocretin" in the treatment of anaphrodisia in the ewe.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 253–254. [See also OPPERMANN, *V. B.* 12. 468.] 1240

749 ewes which failed to come into oestrus were treated with "sexocretin". One day after treatment 76 came into oestrus, two days after treatment—242, three days after—208, 14 days after—56 and 18 days after two came into oestrus. Those which failed to respond were given a second injection when 105 responded. Whether the induced oestrus was accompanied by ovulation is not stated. ["Sexocretin" appears to be a solution of a synthetic oestrogen di (*p*-oxyphenyl) hexene.]—A. T. COWIE.

FERGUSON, J. D. (1946.) **Carcinoma of prostate treated with oestrogens.**—*Lancet.* 251. 551–556. 1241

Repeated biopsies of carcinomatous prostate carried out by the "cold punch" resectoscope, revealed that in nine cases treated by oestrogens (stilboestrol or dieoestrol) nearly all had regression, as judged by the histology and in some instances by the demonstration of tissue acid-phosphatase. In one case it was found that metastases to lymph nodes also regressed.

Acid-phosphatase occurs in the normal prostate and in increased amounts in cancer of that organ. It does not normally occur in lymph nodes, but is present in considerable quantity in nodes affected with metastatic growths derived

from the carcinomatous prostate. It was also found in tubercular lymph nodes and in glands bearing metastases from carcinoma of the stomach and carcinoma of the penis; it was only rarely present in other conditions. The significance of this from the point of view of diagnosis is discussed.

The average survival periods of patients treated with oestrogens are longer than those of patients not receiving this therapy. In a few cases, oestrogens had no effect on the course of the disease, or there was a sudden reactivation after an initial period of regression.—J. G. C.

WILLIAMS, C. M. (1946.) **Continuous anaesthesia for insects.**—*Science.* 103. 57. 1242

The problem has been to find an adequate method of maintaining insects anaesthetized for prolonged periods by the use of agents which have a transient effect.

For the administration of an anaesthetic concentration of CO<sub>2</sub>, the technique adopted depends on the fact that CO<sub>2</sub> is heavier than air. By using the open depression of a Buchner funnel attached to a supply of CO<sub>2</sub>, any depth of anaesthesia may be obtained. The method proved successful with varied insect species and there was complete recovery from anaesthesia. The insects treated showed complete relaxation, and the integument could be opened and the body wall shut again without loss of blood.—P. F. S.

CHALLINOR, S. W., & DUGUID, J. P. (1944.) **Propylene glycol vapour as an air disinfectant.** I.—*Edinb. med. J.* 51. 280–289. 1243

DUGUID, J. P., & CHALLINOR, S. W. (1944.) **Propylene glycol vapour as an air disinfectant.** II.—*Edinb. med. J.* 51. 388–395. 1244

I. The efficiency of propylene glycol as an air disinfectant was tested in air continuously infected by atomization of suspensions of *Serratia marcescens* and in air of a crowded room with largely dust-borne air infection. A single vaporization of the glycol had only a transient effect. Vaporization at the rate of 1 ml. glycol per million ml. air per hour produced about 85% reduction in the air infection naturally present, but there was also perceptible mist formation. Vaporization at lower rates produced a considerable reduction of the artificial air infection but only small reductions of the natural air infection.

II. Vaporization of propylene glycol at the rate of 0.5 ml. per million ml. of air per hour produced and maintained about a 90% reduction in the air infected by mouth spray both in a small crowded and unventilated room (16 occupants) and in a room with only one occupant. Vaporization at this rate, which is about as effective as

hypochlorite vaporization, is recommended for air disinfection of occupied premises. This glycol vaporization produces only some 20% reduction

See also absts. 1103 (TB.), 1106 (Johnes' disease), 1128 (amoebiasis), 1270 (forensic pharmacy).

in the largely dust-borne bacterial content of the air of a crowded room.—J. M. ROBSON.

## LIVESTOCK HYGIENE

DMITRIEVA-KATYAEVA, Z. A. (1940.) Plesnevye gribki furazha i bor'ba s nimi. [Mould fungi in fodder and their control.]—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow*, 1939. [Collected Works.] pp. 166–167. 1245

The author describes the cultivation and staining characters of the following fungi:—*Aspergillus niger*, *Alternaria tenuis*, *Cladosporium herbarum*, *Mucor racemosus*, *Penicillium glaucum*, *Rhizopus* sp., *Stemphylium* sp., *Thamnidium elegans*, *Trichoderma lignosum*, *Trichothecium ros-*

See also absts. 1112 (water-borne infection), 1162 (mouldy fodder).

cum. In tests of their resistance to chlorinated lime, NaOH, NaF, and "silver water", prepared according to Moiseev, chlorinated lime (0.3–2.0 active chlorine) was the most suitable fungicide used. In field tests it reduced the numbers of mould colonies in the air by 97.32% and on wood surfaces by 98.24%. NaOH (1–5%), although possessing some fungicidal action, was much less effective. NaF was of no value as a fungicide; "silver water" was found on the contrary to stimulate the growth of the fungi.—L. LEVENBOOK.

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

SCHÖNBERG, F. (1945.) Zur Mitwirkung und Verantwortlichkeit des Arztes, Tierarztes und Milchwirtschaftlers in der Milchhygiene. [Co-operation of medical and veterinary practitioners and milk producers in dairy hygiene.]—*Z. Fleisch- u. Milchhyg.* 55. 3–6. 1246

S. replies to the claim that the control of dairy hygiene should be shifted from the veterinary to the medical profession in order to prevent epidemics of typhoid. He points out that only the veterinary profession is qualified to determine the health of cows and especially their udders: the eradication of severely diseased cows is the profession's main contribution to the hygienic control of milk production.

The medical and veterinary profession must work together: each has his contribution to make.

—C. AHARONI.

GRÜTTNER, F. (1944.) Über die natürliche Anreicherung der Fleischvergifter im Fleischkörper der geschlachteten Tiere. [Natural enrichment of meat poisoning organisms in carcasses.]—*Z. Fleisch- u. Milchhyg.* 54. 193–194. 1247

G. examined the carcasses of three cows sent to the Hanover slaughterhouse. Some organs were tuberculous, but there were no signs of other disease. Pending further enquiries, the diseased organs were destroyed and the rest laid aside as temporary reject.

Two days after slaughter the meat was examined bacteriologically. Cultures were made from the four quarters and (in two cases) from the kidney. In the plates from the quarters no growth resulted after several days. Those from

the kidney had some growth, but not of food poisoning organisms.

The meat was put in cold storage for further examination and to make sure that no organisms had penetrated from the diseased organs no longer available for bacteriological examination. Fresh cultures were made on the fourth day after slaughter from samples previously examined and kept at room temperature and from meat kept in cold storage. From the first cow, only the sample kept at room temperature had growth of *S. enteritidis*; both samples from the second cow had *S. enteritidis*; samples from the third cow and the kidneys were free of meat poisoning organisms.—E. CHERKESI.

JESPERSEN, K. W. (1942.) Plasmaudvinding af Svineblod. [Separation of plasma from pig blood.]—*Maanedsskr. Dyrslaeger.* 53. 505–510. 1248

The substitution of plasma for milk in sausages stimulated research into more hygienic methods of plasma separation at abattoirs. Procedures, as near as was practicable to those of actual sterilization, were introduced, by cleaning and boiling utensils and washing animals before killing. Inspection, after incubation, of diluted whole blood, plasma and corpuscle smears on agar plates proved that these precautions were justified. The plasma bacteria content was 10–30% of that of the whole blood, as most of the bacteria were centrifuged down with the corpuscles. Untreated milk tested in this way had a higher bacteria content than plasma.—E. F. MCCARTHY.

PETER, H. (1944.) Über eine durch den Para-

typhus E, Typ anatum, hervorgerufene Nahrungsmittelvergiftung. [Meat poisoning by *S. anatum*.]—*Z. Fleisch- u. Milchhyg.* 54. 91-93. 1249

An outbreak of food poisoning is described in which 180 people who had eaten pork were affected. From both the meat and the faeces of patients, *S. anatum* was isolated. Five weeks after the outbreak, specific agglutinins were demonstrable in the blood of some of the patients.

—E. KLIENEGER-NOBEL.

LINON, G. (1943.) Une nouvelle jurisprudence en matière de responsabilité du fait des choses. —Garde juridique et garde matérielle. [Law relating to use of tuberculin.]—*Rev. Méd. vét., Lyon et Toulouse.* 94. 86-88. 1250  
Article 8, paragraph 2, of the Law of France

## ZOOTECHNY

RHOAD, A. O., PHILLIPS, R. W., & DAWSON, W. M. (1945.) Evaluation of species crosses of cattle by polyallel crossing. A study of zebu and Africander × Aberdeen-Angus cattle under subtropical conditions.—*J. Hered.* 36. 367-374. [Abst. in *Anim. Breed. Abstr.* 14. 20, copied *verbatim*.] 1251

A total of 28 mature Aberdeen-Angus were mated with 4 Angus, 2 Zebu, 2 Africander, and 5 Zebu × Africander sires and produced 165 single calves. Average birth weight was 60.1, 78.1, 70.8 and 72.8 lb. resp., and weight at 6 mths 324.5, 397.5, 379.3, and 385 lb. Weights of ♀ calves were corrected to a ♂ basis. In comparison 11 Angus ♂ × Zebu ♀ calves averaged 56.8 (♀) and 56.4 (♂) lb. The Zebu bulls were of Kankrej origin with some Gir blood. Nine of the ♀♀ were mated to all 4 types of bull; 19 to all except the Angus. In both groups variation in birth weight was significantly associated with breed of sire. Variation between means of dams was significant in the 19-dam group only; variation between bulls within a breed was not significant.

Variation in weight at 6 mths. was associated with breed of sire in the 9-dam group only. Variation between dams was significant in the

of July 7th, 1933, makes it an offence for anyone but a qualified veterinary surgeon to keep or use tuberculin and paragraph 3 states that contraventions of this law will be punished by fines.

Preparations containing tubercle bacilli or their products, or any substance for the diagnosis or treatment of tuberculous animals cannot be used, except by the veterinary profession, without a special authorization given by the Minister of Agriculture acting on the advice of the consultative committee on animal epizootic diseases. Such permission is temporary and revocable.

Three cases are cited in which fines were imposed for illicit use of tuberculin by laymen. In each of these cases the veterinarian and agent responsible for supplying the material were also fined.—D. S. RABAGLIATI.

19-dam group only; that between sires within breeds in neither. Weight at birth was correlated with weight at 6 mths. Forty-two offspring of Zebu × Angus cows mated to Angus bulls were somewhat lighter at birth (61.8 v. 67.8 lb.), but heavier at 6 mths. (399.1 v. 338.4 lb.) than 16 from Africander × Angus cows mated to Africander × Angus bulls. The use of polyallel crossing in animal breeding research is discussed.

KELLER, H. (1944.) Die Beugehaltung der Vordergliedmassen als Kennzeichen der Schlachtung kurz vor dem natürlichen Tode. [Flexion of the fore limbs an indication of slaughter in extremis.]—*Z. Fleisch- u. Milchhyg.* 54. 194-196. 1252

K. considers that flexion of the fore-limbs and brownish-red coloration of the flesh are indications that the animal was slaughtered in extremis after a long illness. In his experience these signs are found mostly in cases where metritis and peritonitis are followed by septicaemia. Hyperacidity develops in the tissues and rigor mortis intervenes immediately after death, as shown by the flexion of the fore limbs; the brownish-red coloration is due to the formation of acid myoglobin.—E. CHERKESI.

See also abst. 1271 (artificial insemination).

## TECHNIQUE AND APPARATUS

BERTRAM, D. S. (1946.) An apparatus for collecting blood-sucking mites.—*Ann. trop. Med. Parasit.* 40. 209-214. 1253

The material in which the mites are sheltering is put inside a tube to one end of which is attached the collecting chamber. A heated coil is passed slowly along the outside of the tube driving the

See also abst. 1104 (assay of antibiotics).

mites before it into the collecting tube. Condensation is controlled by pumping dry air into the apparatus against the direction of the heating unit. *Liponyssus bacoti* has been successfully separated from the litter of rat-cages by use of this apparatus and it should prove of value in isolating other Parasitoidea.—T. SPENCE.

## REPORTS

EIRE. (Undated.) **Fourteenth annual report of the Minister for Agriculture, 1944-45.** [O'RYAN, J.] pp. 152 + [76] + 7. Items of veterinary interest pp. 32-41, 70-71 & 95. Dublin: The Stationery Office. 8vo. 3s. 6d. 1254

The items of veterinary interest in this report deal with the Veterinary College of Ireland and with the Veterinary Research Laboratory. At the opening of the session there were 30 new students at the College, making a total of 253 in all, as against 268 the previous year. Thirty-nine students obtained their diplomas, two less than the year before. The report contains a summary of the work of the various departments of the College. In the Physiology and Biochemical Section 132 specimens of mares' urine were tested for pregnancy diagnosis, 129 being positive and 102 negative. No error in diagnosis was reported from this test, but blood examination of 123 samples of mares' blood was less accurate. Bull semen was also examined in ten instances, only one specimen being normal.

In the pathological department 24 cases of CONGENITAL TUBERCULOSIS in newborn calves were reported. JOHNE'S DISEASE is said to be rare in Ireland. The Parasitology and Poultry Sections of the College show a greatly increased activity.

The Veterinary Research Laboratory, which carries out diagnosis and advisory work, preparation and issue of vaccines and research work, dealt with 10,278 specimens, against 3,322 the previous year, and 126,902 doses of vaccines were prepared and issued to veterinary surgeons.

—D. S. RABAGLIATI.

I. AUSTRALIA. (1944.) **Eighteenth annual report of the Council for Scientific and Industrial Research for the year ended 30th June, 1944.** pp. 78. Items of veterinary interest pp. 17, 18, 20, 21, 22, 23, 24 & 61. Canberra: L. F. Johnston, Commonwealth Govt. Printer. fcp. 1255

II. AUSTRALIA. (1945.) **Nineteenth annual report of the Council for Scientific and Industrial Research, for the year ended 30th June, 1945.** pp. 164. Items of veterinary interest pp. 22, 24-26 & 31-44. Canberra: L. F. Johnston, Commonwealth Govt. Printer. fcp. 1256

I. The epidemic type of *Str. agalactiae* causing MASTITIS in dairy cows was found to spread with comparative ease in the milking shed even when the usual precautions are taken. However, when precautions were greater and care was taken to use a hypochlorite solution in sufficient strength (1,000 parts per million) the spread was prevented. In studies on CASEOUS LYMPHADENITIS of sheep it was found that some of the

variants of *Corynebact. ovis* which were not agglutinated by antiserum against the parent strain were agglutinated after treatment with sodium lauryl sulphate, which presumably removes masking layers. BOVINE CONTAGIOUS ABORTION, ENTERO-TOXAEMIA of sheep, other diseases due to clostridia and BOVINE CONTAGIOUS PLEURO-PNEUMONIA were also investigated.

*Anaplasma centrale* kept in blood frozen quickly and preserved at -80°C. was found to be infective nine months later after quick thawing.

It was determined that what had been regarded as the typical manifestations of TOXAEMIC JAUNDICE in sheep, viz, HAEMOGLOBINURIA and HAEMOLYTIC JAUNDICE, were indeed only the manifestations of what may be termed an acute form of the disease. The more chronic form, formerly regarded as a distinct disease, is associated with chronic liver damage and in some cases an obstructive jaundice. Both the acute and the chronic forms are believed to be indications of COPPER POISONING.

Information on the density of *Lucilia cuprina* and the mechanism whereby it is relatively attracted to sheep is being collated to examine the possibility of reducing FLY STRIKE by such means as trapping, poison baits, carcass disposal and destruction of maggots in strike wounds. Attempts were made to reduce tail strike by operative measures to draw the wool away from the sides and tip of the tail. Methods of dehorning rams to control head strike are being studied. The horn fly trap was satisfactory for the control of the buffalo fly (*Lyperosia exigua*) in a dairying district. Herds in which all beasts were sprayed with 4% solution of D.D.T. in kerosene remained virtually free from flies for 2-3 weeks. It was not necessary to spray the whole of the body: spraying of regions which could not be reached by the tail was sufficient and it was found that even when only half of the cows in a herd was treated, fly control was quite effective. Cows which are particularly attractive to the fly should be selected for spraying. Excessive amounts of kerosene injure the skin. The preparation of emulsions and migration of flies from untreated to treated herds is being studied.

Studies were made on increasing the effectiveness of pyrethrins for the control of the house flies by means of activators. Oils of *Backhousia myrtifolia*, *Zieria smithii*, *Melaleuca bracteata* and *Dacrydium franklinii* (Huon Pine) were effective activators. Oil of *Backhousia* was many times more effective than sesame oil. None of the activators found to be effective against flies were effective against mosquitoes.

Larval longevity of the cattle tick (*Boophilus*)

was found to increase with increasing humidities at all temperatures until close to saturation. Newly emerged nymphs and adults experimentally transferred from one host to another reached maturity. The maximum parasitic period for male ticks was 70 days. The mean parasitic period for females was 22.9 days (18.9-35.0 days' range). The natural mean mortality of parasitic stages in the field was 26.2%. Nymphs and adults migrate freely following ecdysis before becoming attached, especially under unfavourable conditions. Oxidation of arsenite to arsenate in used dipping fluid can be prevented by autoclaving or by the use of bacteriostatic agents. Under laboratory conditions oxidized dips tend to be reduced when contact with air is prevented. Spraying with arsenical solutions at 14-day intervals allowed some females to engorge and lay viable eggs, apparently because early nymphal stages are resistant to arsenic; spraying at seven-day intervals prevented development beyond the unengorged nymphal stage. Some unattached larvae survive treatment with arsenic. Arsenic gives practically no protection against reinfestation. Preliminary trials with D.D.T. are promising. The most susceptible stages are the larvae and the newly emerged adult, the least susceptible being the semi-engorged nymph. Protection against reinfestation lasted 2-13½ days with concentrations of from 0.5% D.D.T. in alcohol to 2% in emulsion.

In studies on anthelmintics, all of seven "insoluble" arsenites, but only five of 11 arsenates were found to be effective against *Haemonchus contortus*. A number of "insoluble" compounds of strontium, barium, fluorine, zinc, lead, bismuth and chromium were ineffective. Enemas containing arsenic pentoxide were less efficient than those containing sodium arsenite against *Oesophagostomum columbianum*.

The doses of the phenothiazine usually prescribed were ineffective against immature *Trichostrongylus* spp. 10 and 15 days old but 40 g. into the rumen was effective. A dose of 15 g. every 21-28 days into the rumen of young sheep receiving 2,000-7,000 larvae daily was effective in keeping the worm burden at a low level. Efficiency is not related to the degree of infestation with *Trichostrongylus* spp. and the drug was equally effective whether injected into rumen or abomasum. Suspensions of phenothiazine stored for 12-15 months did not lose anthelmintic potency. Salt-phenothiazine licks were ineffective unless the daily intake of phenothiazine was 0.5 g. or more per head. A daily intake of 0.5 g. was relatively ineffective against *Trichostrongylus* spp. but had more pronounced effects against *H. contortus* and *O. columbianum*. A daily consumption

of 0.5 g. phenothiazine was not as effective as a dose of 15 g. once a month. It was difficult to attain a daily intake of 0.5 g. unless linseed meal was added to the salt-phenothiazine lick. Epidemiological studies have been extended and the effects of rotational grazing on worm burdens and the influence of supplementary feeding on the control of nematode parasites have been studied. Treatment of outbreaks of HAEMONCHOSIS in the field showed that anthelmintics generally lacked efficiency, but that phenothiazine was superior to carbon tetrachloride, copper sulphate and copper sulphate-sodium arsenite mixture. In a field trial, three winter (May, July and August) treatments with phenothiazine reduced worm burdens considerably and prevented the usual spring outbreak of HAEMONCHOSIS.

Investigations into the use of the virus of MYXOMATOSIS for the control of rabbit population were concluded. Investigations continued on fertility in sheep, and on inheritance of skin wrinkles, horns and "faults" (including "hair", "hollow-back" and "grip"). Further observations were made on the periodicity of oestrus in two groups of ewes, one kept constantly with the ram, and the other in which new ewes were put each month with the rams after about a year's isolation. Sexual activity in ewes was lower during the spring months, but the reduction was much less in the second group of ewes.

Enzyme systems responsible for the transport of oxygen in living matter were studied in relation to the physiological function of minor elements. Large areas of Southern Australia are limited in productivity by lack of minor elements in the soil. The application of copper to the soil in fertilizer mixtures is usually sufficient to maintain general health and good wool growth, but additional supplements are essential for optimum wool production. It was found that the character of the fleece was favourably influenced by copper intakes far in excess of that normally present in natural fodders. Mapping of copper-deficient regions is being continued. In seriously affected areas the difference between the value of the fleeces from treated and untreated sheep is considerable, amounting to 4/- per head. The Border Leicester and the Merino differ in their ability to deal with an excessive intake of copper. Studies on calcium metabolism of sheep fed on cereal grains and the utilization of various grades of ground limestone have been continued. Sheep utilize phytic acid phosphorus more efficiently than non-ruminants. Four distinct chemical types of urinary calculi were found in sheep. They consisted mainly of calcium magnesium carbonates, calcium magnesium phosphates, calcium ammonium phosphate, or silica. Work on

the energetics of drought feeding provided data for the simple formulation of minimum rations necessary for maintenance. Results are to be published as a monograph. When pastures are green and rich in vitamin A precursors, sheep store large amounts, sufficient to tide them over dry periods of usual duration. Reserves may be exhausted during long continued drought.

Urea, alone or with inorganic adjuvants, was not thought likely to prove an efficient substitute for protein supplements to increase wool production. Comprehensive trials were made on the influence of nutrition on wool production. The general conclusion was that many sheep grown under natural grazing conditions in Australia never expressed their full hereditary capacity as wool producers. During pregnancy wool production was found to decline although food consumption remained steady. During lactation both food consumption and wool growth increased. Considerable time was devoted to techniques, including methods of measuring wool quantities and qualities and analysing the results statistically. Histological techniques were used for the determination of fibre and follicle population density, the ratio of primary follicles, the functional activity of the follicle, the population density and the relative number of sweat glands, the relative size of primary and secondary fibres and the source of variability in fibre diameter.

The toxicity of wheat for the horse was investigated. Feeding linseed "nuts" containing 0.05% available HCN to sheep fasted for several days sometimes resulted in death from HCN poisoning. *Myoporum deserti* (Ellangowan or Turkey Bush) was found to be toxic for sheep. Symptoms included drowsiness followed by collapse, oedema, transient HAEMOGLOBINURIA and JAUNDICE. Studies were begun on contact toxicity of arsenic, rotenone and D.D.T. against keds and lice. The stability of lime-sulphur dips and the use of wetting agents were studied. Sheep weighing 70-100 lb. absorbed 50-90 mg. arsenic when dipped in a 0.2% solution of sodium arsenite.

Other subjects dealt with included pasture management on sown and natural pastures, using grazing sheep as indicators of production, investigations into weeds, grazing trials with *Paspalum scrobiculatum* and other grasses, investigations into medicinal plants (hyoscyne, atropine, opium, quinine, ephedrine, pyrethrum), medical entomology, dealing with control measures against fleas, mosquitoes and flies, canning bacteriology, with particular reference to *Cl. botulinum*, fellmongering investigations, dairy research on hardened butter substitutes, dry butterfat, etc.

II. Epidemiological studies on MASTITIS in

cattle were continued. Penicillin was used in an attempt to eradicate infections of *Str. agalactiae* and of staphylococci from the udder. Complement fixation tests for TUBERCULOSIS in cattle were carried out using an antigen prepared from distilled water extracts of human and bovine type lipoid-extracted bacilli. Of 525 sera from cases of bovine TB. confirmed at autopsy, 92% gave positive reactions; of 86 tuberculin reactors which showed no visible lesions at autopsy, 50% gave positive reactions.

Work with strain 19 vaccine against BOVINE CONTAGIOUS ABORTION was continued. The causes of unsatisfactory viability appear to be complex. The prescribed buffered saline does not prevent a lowering of pH to undesirable levels. There is evidence that in some cases zinc leached from rubber stoppers may reduce viability. Viability also varied with cultures made from different batches of potatoes. Sterile skim milk is a superior suspending fluid. Intracutaneous and intracaudal (subcutaneous tissue at the tip of the tail) inoculations were much more efficient than subcutaneous inoculation. A dose of 1 ml. intracaudally gave 2.2 times the response given by 5 ml. subcutaneously. In calves 4-8 months old 0.2 ml. intracaudally or intracutaneously was as effective as 5 ml. subcutaneously. In studies of the toxicity of wheat for stock, the decarboxylating bacterial flora was found fairly regularly in the stomach, not only of wheat-gorged horses but of horses fed on normal diets. Unsuccessful attempts were made to isolate bacteria capable of producing histamine in peptic digest of wheat or in histidine broth. *Cl. welchii* was never found in this material. With mixed cultures decarboxylation was most effective anaerobically and at low pH. Addition of 3% ground limestone to wheat did not prevent the fall in pH in the stomach. Copper in practicable doses did not depress the bacterial flora or inhibit histidine decarboxylase. The toxic sulphur-containing protein purothionin in repeated doses totalling 1 g. (equal to 20 lb. wheat) produced no obvious abnormality in horses. In an endeavour to fix the virulence and immunizing properties of the vaccine against BOVINE PLEURO-PNEUMONIA, preservation of the seeding cultures in the frozen state at -80°C. by means of solid carbon dioxide was introduced. Preliminary observations were made on a pleuropneumonia-like organism isolated from human genito-urinary infections. There was considerable cross-reaction between the human and bovine types.

Grazing on the summer growing annual *Heliotropium europaeum* favoured the occurrence in sheep of HAEMOLYTIC JAUNDICE. In the majority of sheep dying the liver copper concentra-

tion was over 1,000 p.p.m. and in one case was 3,070 p.p.m. In laboratory experiments it was shown that in sheep on a normal diet an increase of 10–100 mg. molybdenum per day resulted in a reduction in copper content of the liver. A new attack on the problem of HAEMATURIA VESICALIS of cattle is planned following the finding that the molecular ratio of ethereal sulphate to combined phenol is "highly significantly" lower in the urine of cows in affected districts than in unaffected districts.

A 1:10,000 sodium arsenite dip completely eradicated biting lice (*Bovicola ovis*) from individual sheep. Studies on arsenic-sulphur dip showed that the sheep dipped first retained as much soluble and insoluble arsenic as those dipped last when suint would have increased the wetting properties of the dipping fluid. The addition of soap as a wetting agent did not affect the amount of arsenic retained by the fleece. The base of the wool staple contained less soluble and insoluble arsenic than the tip. The neck, mid-side and belly wool retained less arsenic than other parts of the fleece. A suspension of 8 oz. Timbo root (4.6% rotenone) in 100 gal. of water killed all adult keds (*Melophagus ovinus*), but a few emerged from pupae later and survived. A high proportion of lice (*B. ovis*) survived the treatment. Preliminary trials showed that a 1:5,000 D.D.T. emulsion killed all adult keds in a few hours and over four weeks elapsed before reinfestation could be established. Adult lice were killed by a 1:2,500 emulsion, but some survived a 1:5,000 dilution. *B. ovis* will live on material scraped from the sheep's skin, but the life-cycle is speeded up by the addition of yeast. Eggs require a temperature of 37°C.: none hatch at 32°C. If kept at 27°C. for two days, then kept at 37°C., no hatching occurs. Hatching occurs in 9–11 days and the period from egg to egg ranges from 38–50 days. Humidities of 50–70% are satisfactory; 90% is unfavourable but not lethal. Lesions of the legs of sheep in certain regions of the central highlands of Queensland were due to *Trombicula sarcina*, Womersley 1944. The mites also cause irritation to man. Kangaroos are the natural hosts. Fully grown *Lucilia cuprina* larvae were unaffected by crawling on D.D.T. crystals or in inert dusts containing D.D.T., by immersion for 10 min. in kerosene solutions or in aqueous suspensions of the drug. Surfaces treated with D.D.T. killed adult sheep blowflies which rested on them. A comprehensive field trial on the density of *L. cuprina* was completed. A circular area of 50 sq. miles was trapped, using 102 traps. Stained flies were liberated and the density of the natural populations was determined from the ratio of stained and unstained flies caught. Population

density varied from 0.3 to 5.7 flies per acre. Extensive trials confirmed the value of docking the tail at the optimum level in reducing the incidence of FLY STRIKE. Lamb-marking dressings were studied from the point of view of preventing FLY STRIKE in tailing wounds. Dressings containing oil of citronella were of greatest promise. Methods of dehorning Merino rams for prevention of FLY STRIKE on the head were tested. Complete surgical removal of all horn growing tissue is essential if regrowth is to be prevented.

The biology of the tick (*Boophilus*) was further studied. The young larva, young nymph and young adult are the stages most susceptible to arsenical dips. Detailed study of the life-cycle showed that by dipping three times at three-day intervals and repeating this after a further 15 days, every tick on an animal, irrespective of the time it attached, would be exposed in a vulnerable stage before it could reach maturity. This "strategic dipping" was effective in field trials in completely ridding cattle of the normal strain of the tick. Of two million ticks on two animals infested with the arsenic resistant strain only 300 survived such dipping. The arsenic-resistant strain of tick is causing considerable difficulty in control. All stages of the life-cycle manifest arsenic resistance. Arsenical dip buffered to pH 2, 4, 6, 8, 10 and 12, was used in laboratory experiments against arsenic resistant ticks. Almost 100% mortality was obtained at both extremes, whereas there was no mortality at pH 8. The average pH of arsenical dipping fluids in the field was found to be 8.4. Alteration of the pH should greatly enhance the efficiency of arsenical dipping. Dipping fluid in the dipping vat undergoes oxidation fairly quickly, but this can be prevented by floating a raft on the surface of the fluid. A 2% emulsion of D.D.T. was highly efficient against all parasitic stages of the tick and protected against reinfestation for about 12 days. A bacterium closely resembling the South African *B. arsenoxidans* was isolated from dipping fluid. The standard Buffalo Fly trap with gauze boxes for catching the flies which leave cattle as they pass through presents some difficulties in construction. The gauze boxes were replaced by glass or other transparent material sprayed inside with D.D.T. The flies are brushed off the cattle and flying towards the light coming through the transparent sides of the trap come into contact with the D.D.T. on the surface. The standard trap modified in this way was very effective and is much easier to construct. One treatment with D.D.T., applied as a kerosene solution and providing 20 g. of the drug for the entire treatment, was effective for about two months.

The efficiency of spraying cattle with D.D.T.

was confirmed. The drug remains lethal on the living animal for about 14 days, compared with five months on the hide of a slaughtered animal. Adequate control was obtained by spraying an area of 12 in.  $\times$  18 in. on either side of the withers. Studies on the dispersion of the flies showed that there may be considerable migration from property to property. Flies were marked by exposure to fine metallic dusts instead of by spraying with alcoholic solutions of dyes which were somewhat injurious. The predaceous beetle, *Platylister chinensis*, from Fiji was liberated in the Cairns district.

Studies on repellents against insect pests resulted in the Australian Army being the first to use dimethyl phthalate as a mosquito repellent. Good mosquito repellents are effective against many other biting insects such as sandflies, but may be ineffective against non-biting flies such as *Musca* spp. Cat-fleas (*Ctenocephalides felis*) were rapidly killed by exposures to D.D.T. Lethane 384 gave promising results, but Thanite, paradichlorobenzene and naphthalene were of little value. A concentration of 0.01% D.D.T. in the sand rearing-medium destroyed newly hatched as well as fully grown flea larvae.

A further series of arsenical compounds were tested as anthelmintics. Arsenites were generally more effective than arsenates against *Haemonchus contortus*. Phthalates (dimethyl and dibutyl), washing blue and "Stovarsol" were ineffective. Hexachlorocyclohexane ("666") had slight efficiency against *H. contortus* and *Trichostrongylus* spp. Small repeated doses of phenothiazine given daily or every few days depressed egg production by *Trichostrongylus* spp. and prevented development of larvae in faecal cultures, but few worms were killed and egg counts soon returned to pre-treatment levels when doses were discontinued. Two sheep heavily infested with *Trichostrongylus* spp. dosed daily with 1.0 g. and 0.5 g. phenothiazine, respectively, died in 2-3 weeks from TRICHOSTRONGYLOSIS. Phenothiazine was equally effective against *Trichostrongylus* spp. in sheep scouring as a result of TRICHOSTRONGYLOSIS as in infested sheep passing normal faeces.

Gentian violet in large doses was moderately efficient, and nicotine bentonite was not more effective than nicotine sulphate against *Trichostrongylus* spp. Daily doses of 0.5 and 1.0 g. phenothiazine were given in two groups of four sheep infested with *Oesophagostomum columbianum* for 18-32 days. The 0.5 g. dose was relatively ineffective; the 1.0 g. dose was highly effective in three out of four sheep. Thiophenyl-naphthylamine, methyl phenothiazine and phenyl-naphthylamine had but slight efficiency against *O. columbianum*, while nicotine bentonite and hexa-

chlorocyclohexane were ineffective. Epidemiological studies are gradually providing data on the seasonal conditions which favour worm infestation. In the spring or early summer and often again in autumn the worm population (chiefly *Haemonchus contortus*) suddenly declines to very low levels without treatment. This phenomenon of "self-cure" has been observed concurrently on sheep properties 20 miles apart. It is not due to worms dying from old age. *Dictyocaulus filaria* infestation increases in the autumn, reaches its highest level in late winter and decreases markedly and suddenly in early spring. Field trials dealing with phenothiazine-salt mixtures gave inconclusive results owing to drought. Sheep offered 1:15 phenothiazine/salt mixture consumed only 1.48-2.3 g. per head per day and those offered a 1:30 mixture consumed 0.93-2.8 g. per head per day. The daily intake of phenothiazine was much below 0.2 g. per head per day.

Relatively light, sub-clinical, infestations with *Trichostrongylus* spp. resulted in loss of appetite, loss of body weight and considerable reduction in wool growth. Infestation with *O. columbianum* caused a decrease from an initial food intake of 2.5 lb. per head per day to 1.5 lb. per head per day within three weeks. Some 30 weeks later the daily food intake was still below 2.0 lb. Owing to shortage of nicotine sulphate attention was given to tetrachlorethylene as a substitute for use against *Trichostrongylus* spp. Emulsions containing this drug and copper sulphate were prepared. Drenching apparatus designed by proprietary firms for administration of tetrachlorethylene and copper sulphate concurrently as a temporary mixture or separately in succession was tested. Studies at the Field Laboratory at Armidale included the effects of rotational grazing, supplementary feeding and winter use of phenothiazine on control of worm parasites. In the field a dose of 7 g. of phenothiazine was as effective as one of 18 g. against *H. contortus*, but neither dose was highly efficient against immature worms of this species. Doses of 14 and 18 g. of phenothiazine for ten-month-old weaners were only partially effective in controlling TRICHOSTRONGYLOSIS under outbreak conditions.

In studies on animal breeding it was found that rams may be ranked on individual characters when successive observations are made on the same progeny, e.g., at one and two years of age, and when the same rams are retested with a different random selection of ewes. Groups of 30 progeny per ram are necessary. Some rams ranked differently when judged on their male progeny from when judged on their female progeny. It was found that the first and second 17-day periods of mating are most important

during the height of the breeding season. During the first period 81% and during the second 15% of ewes conceived. A flock of Merino ewes lambing at 15-24 months dropped 23% lambs, at 28-33 months, 56%, at 40-45 months, 82%, and thereafter approximately 80% annually. A crossbred flock and other Merino strains had similar trends but at different levels. Infantile mortality and death of ewes during lambing was associated with delayed sexual maturity. A group of Merino weaned lambs examined daily from nine months of age showed 48 per cent. as their maximal occurrence of oestrus for only one month prior to their reaching 21 months of age. In the following year the figure was 100% for two consecutive months and during the subsequent year 100% for five consecutive months. Studies on genetics included inheritance of skin wrinkles, establishment of inbred flocks, and inheritance of "faults" (hollow back, parrot mouth, hairiness) and horns.

A Zebu-Jersey crossbred dairy herd was being built up.

Chemical methods were unsatisfactory for the assay of oestrogens in sheep's urine owing to low concentrations (except in late pregnancy) and the presence of phenolic and other compounds which mask colour reactions. Injections of hexoestrol induced lactation in eight ewes out of 12. Responses varied from sheep to sheep and appeared to be unrelated to dose rate, body weight, or food intake. Two ewes which did not respond over a period of three weeks produced some milk when injected with 10 mg. thyroxin. Controls given thyroxin alone did not lactate. The possibility that excess of oestrogens produced in the late stages of twin pregnancy may explain the loss of appetite which often initiates PREGNANCY TOXAEMIA is being investigated. Other investigations included preliminary examination of the incidence of reproductive diseases (INFERTILITY, DYSTOKIA and prolapse of the uterus) in sheep grazing on pastures in which a certain strain of subterranean clover predominates.

Detailed studies on nutrition and wool production, interrupted by the war, were resumed. In the studies of drought feeding and general metabolism, attention was being devoted to the nutritive requirements of the symbiotic micro-organisms in the rumen, with particular reference to utilization of simple nitrogenous substances as supplements for the sheep. Work on the digestion of carbohydrates by sheep was resumed. Energy metabolism studies were devoted mainly to dissipation of energy by sheep during prolonged intervals of starvation supervening on periods of feeding at different levels and on the capacity of simple fatty acids to provide energy requirements of fasting sheep. It was shown that symptoms of

VITAMIN A DEFICIENCY are likely to appear after sheep have grazed on deficient pastures for six months. It is likely that the effects of the lack of vitamin A will be reflected principally on reproduction. Birth of dead or weak offspring is a regular feature of VITAMIN A DEFICIENCY. Analysis of the amino acid constitution of the proteins of plants was continued. The protein of the seeds of *Trifolium subterraneum* had a very small methionine and cystine content. The tryptophane content of the seeds of several legumes was low. The oxygen transfer in tissues of normal animals and those rendered deficient of certain minor elements and methods for assay of cytochrome *c* oxidase were studied. Methods were developed for the continuous intravenous injection of nutrient solutions into sheep confined in the chamber of the indirect calorimeter. DIABETES MELLITUS was induced in sheep by injection of alloxan and responded favourably to insulin.

Administration of the equivalent of 0.1 mg. cobalt per day, in three doses each week, provided the total Co requirements of growing Merino sheep on the cobalt-deficient calcareous dune regions of South Australia. The daily intake from the fodder was approximately 0.04 mg. Experiments over a number of years show that cobalt must be supplied at frequent intervals. Massive doses at intervals over a month did not prevent acute symptoms of COBALT DEFICIENCY. Pasture topdressings with 5 lb. cobalt sulphate per acre had little effect on the concentration of cobalt in the fodder plants. Intravenous injection of cobalt neither prevented nor corrected the untoward effects of deficiency in sheep. Improvement in wool quality reached a maximum in groups of sheep receiving between 7.5 and 10 mg. copper per day. In field trials, sheep given copper supplements as well as grazing on copper-dressed pastures produced more wool than sheep not given the supplements and some of the latter sheep had subnormal blood copper levels and their fleeces gave evidence of COPPER DEFICIENCY. The manufacturing performance of wool grown by sheep with COPPER DEFICIENCY revealed a number of imperfections, particularly low tensile strength of the fibre. In studies on the mineral metabolism of sheep, coarsely ground limestone was found to be less effective than finely ground in offsetting the adverse effects of a cereal diet upon dentition, appetite, growth and wool production. The marked loss of appetite in sheep on diets low in calcium and high in phosphorus was very striking. Poor utilization of calcium and phosphorus from meat and bone meal was probably due to the particles of bone in such meals being relatively coarse. Dental abnormalities seen in sheep on

low calcium-high phosphorus diets resembled those seen in FLUOROSIS.

Characteristic FLUOROSIS lesions of the teeth of sheep were observed in parts of Australia where the animals were confined to certain artesian waters. Analyses of water showed 2-20 parts per million of fluorine, but these concentrations are probably increased materially by evaporation from bore drains and troughs.

In studies on poison plants force feeding of sheep with *Oxalis cernua* and *Threlkeldia proceriflora*, both of which are rich in oxalates, showed that they may cause acute HYPOCALCAEMIA which can be cured by injection of calcium gluconate.

Studies on methods of sampling Merino fleeces continued. Fibre diameter had a consistent increase from shoulder to midside to thigh. The midside sample was close to the mean of the eight sites sampled on each sheep. Samples from opposite sides were comparable. A comprehensive experiment was begun to measure fleece production by Merino and Corriedale ewes in response to fluctuating planes of nutrition. One group was on a declining level of nutrition, one on an increasing plane and a third on a uniform level. The arrangement and structure of the glands and hair follicles in the skin of 27 mammalian species were examined for comparison with sheep. The same general follicle-group plan occurs over most regions of the body in all species examined, but the concept of the "follicle group", as defined for the sheep cannot be directly applied to other species. A working model of a compressometer was used for determination of the density of fibre population.

Other investigations of veterinary interest include studies on pasture management and the establishment of introduced grasses, proposed field work on irrigated pastures, further work on medicinal plants, analysis of soils habitually licked by sheep, agrostological studies in regions in which soils are deficient in the minor elements, bacteriology of canned foods, dairy research on concentrated hardened butter and biometrical work related to many of the investigations in progress, including, in particular, the fitting of curves of a complex exponential form of growth measurements in wool biology studies, analysis of data from progeny testing trials and preparation of nomograms for the constitution of a flock of sheep at the end of a given time.

The report lists staff, publications and gives details of finance, composition of research committees, etc.—H. McL. GORDON.

AUSTRALIA. (1944.) *Eighth annual report of the Australian Wool Board for year 1943-44.* pp. 23. Items of veterinary interest pp. 9-17 & 20. Melbourne: Stockland Press. 4to. 1257

This report deals with publicity and also presents the results of research financed by the Board's funds on problems relating to sheep and wool.

Further field trials on sheep blowfly showed the value of the longer tail and the modified Mules' operation in reducing the incidence of strike. Docking the tail short delayed healing and infection and fly strike of the wound. Results were the same whether the tail was docked through a joint or through the bone. A new strike dressing known as B.K.B. was developed consisting of 15% boric acid, 9.3% kerosene, 5.4% orthodichlorobenzene, 3% bentonite, 0.5% "Agral 2" and water to 100%. It kills maggots much more rapidly than the standard B.T.B. dressing [see *V. B.* 12. 618]. Breech strike in sheep infected by the nodule worm (*Oesophagostomum columbianum*) was reduced by a combination of Mules' operation and treatment with phenothiazine. Sheep heavily infested with *Bovicola ovis* gained 4.7 lb. body weight in nine months and produced 6 lb. 14 oz. of wool, whereas control sheep gained 22.9 lb. and produced 8 lb. 6 oz. of wool.

Investigations over ten years show that MYXOMATOSIS virus cannot be used to control rabbit populations under most natural conditions in Australia.

In investigations on breeding, body wrinkles and wool fibre density were found to be polygenic in character, but in general, "plain body" was dominant over "wrinkles". Polledness in the Merino, and the inheritance of hair, hollow-back and grip as faults were also studied. In a survey of the practical problems involved in progeny testing Merino rams, over 1,000 progeny from 60 rams were examined as to body weight, skin development, raw and clean scoured wool, staple length and uniformity of fibre diameter. Observations were continued on the influence of vitamin A on the fertility of rams. Individual susceptibility, nutritional state and season appear to influence the relationship between VITAMIN A DEFICIENCY and seminal degeneration.

COPPER DEFICIENCY, acute or incipient, was shown to manifest itself first by replacement of the natural crimp of the wool fibre by a straight shiny characterless growth. Administration of copper salts in a lick or by top-dressing of pastures, prevented this undesirable change in the fleece. In regions where copper deficiency is pronounced, additional supplements over and above those required to maintain normal good health resulted in improvement in wool quality. Finely ground limestone was more efficient than coarsely ground limestone or bone-meal in promoting normal growth and teeth development in sheep on cereal diets. The exclusion of bran from the cereal

ration did not obviate the need for additional calcium. Losses among rams transported over long distances by rail were prevented by feeding them generously on good quality roughage and concentrates for some days before the journey.

In studies on poisonous plants, high oxalate contents were found in *Tetragoma expansa* (New Zealand spinach), *Calandrinia* spp., *Salsola kali* (roly-poly), and *Portulacca oleracea* (pigweed). *Myoporum deserti* (Ellangowan poison bush) was poisonous for sheep.

Work on itch mite (*Psorergates ovis*) revealed that lime-sulphur dip may be used after being left in the dipping bath for a week, although it deteriorates rapidly thereafter. When it is used in spray or shower dips, the intense aeration causes rapid oxidation; lime-sulphur causes irritation of wounds and should not be used within a week of shearing. Carbon bisulphide was highly efficient against *Trichostrongylus* spp. but its toxicity precludes its general use.

A hairpin type fleece caliper was devised for defining and collecting wool samples from a unit area in the field. An instrument for measuring compactness of fibre population on unit areas was under construction. Measurements of fibre diameters showed that in general Australian Merino wools tended to be finer than the crimp indicated.—H. McL. GORDON.

UNION OF SOUTH AFRICA: JOHANNESBURG. (1945.)

**Report of Director of Abattoir and Live Stock Market Department for the period 1st July, 1944, to 30th June, 1945.** [KIRKPATRICK, A. C.] pp. 11. Johannesburg: Radford, Adlington, Ltd. fcp. 1258

The European staff of this Department consists of 76 permanent and 88 temporary members, but of these, only one, the Director, is a professional man. No less than 280,066 animals passed through the open market in the year under review and 67,387 through the quarantine market. It is stated that since the Department was formed, in 1910, 41,334,517 animals have passed through the markets.

A scheme for the regulation of the production and marketing of livestock, meat and meat products is under consideration. There has been no serious outbreak of disease and of the 1,733 mules and horses and 1,207 oxen belonging to the City Council, 492, or 28%, have been treated in the animal hospital. Out of 9,059 cows inspected, four were found to have signs of open TB.

Tables are appended giving statistics for meat inspection: it is noteworthy that only 99 cattle carcasses were condemned for TB., although 539 pig carcasses were seized for this disease. There were no less than 787 beef and 2,198 pig carcasses condemned for CYSTICERCOSIS. CASEOUS LYMPH-

ADENITIS was responsible for the condemnation of 171 sheep and five goats.—D. S. RABAGLIATI.

NORTHERN RHODESIA. (1945.) **Veterinary Department. Annual report for the year 1944.** [HOBDA, J.] pp. 16. Lusaka: Govt. Printer. fcp. 1s. 1259

The policy of the Department remains to "safeguard, foster and promote the livestock industry of Northern Rhodesia, and to facilitate trade in livestock while adjusting to changed circumstances such control measures and restrictions as may be necessary for disease prevention or eradication". The European staff was short by 35%, but, nevertheless, there was increased activity in departmental functions. Great assistance was obtained by the acquisition of a departmental aircraft which flew over 25,000 miles in the year.

Considerable progress was made in the eradication of BOVINE CONTAGIOUS PLEURO-PNEUMONIA by vaccination, compulsory purchase and slaughter and careful examination P.M., 12,000 cattle being handled and 10,000 slaughtered at the abattoir under veterinary control at the Cold Storage Control Board Works, Livingstone.

Success in the treatment of TRYPANOSOMIASIS in cattle was achieved by the use of phenanthridinium compound, no. 897. FOOT AND MOUTH DISEASE was treated by isolation methods and inoculation of the non-affected portion of the herd with virus to hasten its spread throughout. Research was carried on under continued difficulties, but investigations were made on BOVINE CONTAGIOUS PLEURO-PNEUMONIA, TRYPANOSOMIASIS and PSEUDO-URTICARIA, which caused considerable losses. It is stated that Ayrshire cattle, of which there were a few, appeared to be insusceptible to this disease. Tables are appended showing the cattle population and export and import of livestock and livestock products.

—D. S. RABAGLIATI.

GOLD COAST COLONY. (1945.) **Report of the Department of Agriculture for the year 1944-45.**

[URQUHART, D. H.] pp. 8. Items of veterinary interest p. 2. Accra: Govt. Printing Dept. London: Crown Agents for the Colonies. fcp. 1s. 1260

The only reference to livestock in this report is to the expansion of pig breeding in the Colony: it is stated that at one farm the health of pigs was markedly improved since they had been kept in fly-proof sties. Reference is also made to cattle kept successfully on certain farms: sheep losses were very low, while at Asuansi deaths were the lowest on record and regular dosing had apparently kept the flock free from worms. There is no mention of any veterinary staff in the report.

—D. S. RABAGLIATI.

GREAT BRITAIN. (Undated.) **British Empire Cancer Campaign. Twenty-third annual report, 1946.** [LOCKHART-MUMMERY, J. P.] pp. 186. London: British Empire Cancer Campaign. 4to. 1261

Most of the work summarized in this report has already been published. The increased size of the report reflects greater activity at the research centres and institutions financed by the campaign. The volume of work published in this country has induced the campaign to undertake the production quarterly of *The British Journal of Cancer* as its official organ. The first number is promised during the spring of 1947.

Among the large number of contributions dealt with in the report the following are selected as being of special interest to veterinarians:—

Ethylcarbamate (urethane) was found to have a marked effect on experimental tumours: in the case of the Walker sarcoma in the rat the drug caused replacement of the tumour by a more fibrous structure with spindle cells and an abundant stroma. Clinical trials with urethane and isopropylphenylcarbamate in human cancer gave at most a slight temporary amelioration, but the effects in patients with leukaemia were striking, being very similar to those produced by X-ray therapy.

Further work on the response of different species of animals to the highly potent carcinogen 9:10-dimethyl-1:2-benzanthracene, applied to the skin showed that even the notoriously unresponsive skin of the g. pig may be made to develop tumours when a sufficiently active agent is used. Of ten g. pigs painted with 0.5% of the agent in benzene once weekly for 20 months, three developed tumours. The rat was less responsive to skin painting than the mouse, but was as susceptible to subcutaneous injection of the agent.

The relative activity of some carcinogenic azo-compounds was found to differ according to the species of animal used. Hence, theories explaining the relative carcinogenicity of compounds in one species cannot be applied without test to other species.

A high incidence of lung adenomas developed in mice receiving repeated doses of urethane (intraperitoneally or by stomach tube) for a period of five weeks. This confirms recent American work. In view of the effect of urethane in suppressing production of leucocytes it is suggested that it may depress the defensive mechanism of the host and allow a latent agent to produce lung tumours.

Inoculation into the skin of rabbits of the Shope papilloma virus and the sheep dermatitis virus showed that when both viruses were injected simultaneously both of them could be recovered

subsequently, whereas when one virus was inoculated after the other the papillomas which developed proved non-infective. It appears that when the viruses are injected together both of them invade the normal tissue cells and the papilloma virus determines the fate of the cells, so that they form a papilloma, whilst the dermatitis virus, although it survives and multiplies, is suppressed and apparently remains ineffective. The method of simultaneous inoculation of the two viruses has enabled the Shope papilloma to be passaged through domestic rabbits for the first time: it has not hitherto been possible to recover the virus from the malignant lesions which it causes in the domestic rabbit.

The total amount of virus demonstrable in virus-induced tumours in fowls is only sufficient to allow of one infective particle per 100 tumour cells. This means that the simple picture of virus-induced cancer as a transmission of infective virus from cell to cell during malignant growth is incorrect: most of the tumour cells must clearly be "virus-free" or "non-filterable tumour" cells. Penicillin was found to have no effect on the Rous no. 1 tumour or on the virus.

The use of radio-active and stable isotopes as tracers has provided a new tool in cancer research. It is known that inorganic P is rapidly absorbed by growing tumours and it is hoped that by using radio-active P it may be possible to trace the course of tumour cells during the course of metastasis.—E. G. WHITE.

NYASALAND PROTECTORATE. (Undated.) **Annual report of the Veterinary Department for the year ended 31st December, 1945.** [DE MEZA, J.] pp. 4. fcp. 1s. 1262

TRYPANOSOMIASIS is still prevalent in some areas. In the Southern Province it seems to respond to treatment with phenanthridinium compound S.897 administered intramuscularly; Phenanthridinium 1553 has also been tried with encouraging results. In Karonga district, however, no success followed use of either of these drugs, tartar emetic or stibophen. In this district the vector was *Glossina brevipalpis* which had increased considerably in the last few years. Movement of cattle into, through or out of the infected areas was prohibited and all traffic and travellers had to pass through decontamination sheds. Some 3,500 flies were caught in these sheds.

EAST COAST FEVER was decreasing, but PIROPLASMOSIS increased in the trypanosome areas as a result of restriction of movement to and from dipping centres.

The incidence of RABIES was reduced as a result of wide publicity and better understanding by the public of the nature of this disease.

—R. MACGREGOR.

CYPRUS. (1946.) **Annual report of the Department of Agriculture for the year 1945.** [McDONALD, J.] pp. 8. Items of veterinary interest pp. 5 & 6. Nicosia: Govt. Printing Office. 8vo. 1s. 1263

Compulsory inoculation of livestock against ANTHRAX was continued, and 655,000 head were inoculated. There were two positive cases.

Thirty-three cases of WARBLE FLY INFESTATION of cattle were reported. Most of these were due to *Hypoderma aeratum*, the goat fly that will occasionally attack cattle. The single specimen found of *H. bovis* was believed to have escaped from a quarantine station for imported cattle. Parasites of goats and sheep were dealt with by drenching with copper-sulphate + nicotine and by intraruminal injections of carbon tetrachloride for flukes.

The sires of various species kept at the Government Stock Farm were all in good use among villagers. At this farm a cow gave 12,910 lb. milk in 310 days and three averaged over 11,000 lb., but the B.F. percentage was only 9.05. Some fat-tail ewes averaged 130 lb. in 141 days after suckling lambs for 58 days. Nannies averaged 076.5 lb. in 163 days. Large Black Sows averaged six weaners weighing 23 lb. at weaning. Rhode Island hens, averaging 140 eggs, proved superior to Light Sussex averaging 126.

—R. MACGREGOR.

COLONY OF MAURITIUS. (1945.) **[Report of] Veterinary Division [1944].** [LIONNET, F. E.] —Rep. Dep. Agric., Mauritius, 1944. pp. 25-27. 1264

P.P.D. Weybridge tuberculin was used by officers of the Veterinary Division on 266 animals in 11 different establishments. Seventeen animals reacted to the test and were slaughtered, but it is not stated whether P.M. examinations were made, or what was the result.

7,970 equines and bovines were examined for TRYPANOSOMIASIS, both clinically and by blood examination, all with negative results. The total cattle population on the estates at the beginning of 1944 was 10,123 head, as against 11,672 the previous year. Ten purebred Friesland bulls were imported from South Africa during the year.

—D. S. RABAGLIATI.

U.S.A.: MICHIGAN. (Undated.) **Report of the School of Veterinary Medicine, Michigan State College, East Lansing, 1945.** [GILTNER, W.] pp. 65. 8vo. 1265

The first part of this report deals with the various departments of the School. The total number of students, including those on a pre-veterinary course, was 419 as compared with 428 for the previous year.

Under the Extension Specialist's Department

for Animal Pathology, MASTITIS and BOVINE CONTAGIOUS ABORTION figure most prominently. Much trouble has been caused by promiscuous vaccination against abortion and the consequent production of many reactors. Some doubt is cast on the efficacy of the vaccination of calves, some of which do not appear to become immunized. The report ends with a summary of the experimental work carried out, largely on BRUCELLOSIS.—D. S. RABAGLIATI.

DENMARK. (1945.) Aarsberetning fra Veterinær-direktoratet for Aaret 1944. **[Annual report of the Veterinary Directorate, Denmark, 1944.]** Nielsen, F. W. pp. 155. Copenhagen: Universitet-Bogtrykkeri. [French summary.] 1266

The work of the Directorate now covers all veterinary activities, the control and organization of meat inspection having been included in 1944. The chief personnel of the various divisions of the service are listed.

Only four cases of ANTHRAX were observed. FOOT AND MOUTH DISEASE occurred on 74 farms during the last three months of the year, after a period of freedom lasting for seven months (the longest such period since 1936). Virus type determinations in 11 herds revealed that all had type O virus and one also the A type. Vaccination was applied to nearly 300,000 animals. BOVINE ENZOOTIC MENINGITIS was observed in 17 cattle in four herds: ten died. MALIGNANT FOOT ROT in sheep was not observed. EQUINE INFECTIOUS PARAPLEGIA occurred on seven farms affecting ten horses, of which six died. EQUINE MANGE affected six horses and EQUINE INFECTIOUS PNEUMONIA 28, two dying.

Statistical and descriptive information is given of the so-called milder contagious diseases, of which the following are featured, numbers referring to affected herds:—BOVINE PASTEURILLOSIS (68), SWINE PLAGUE (2,692), CALF DIPHTHERIA (1,212), ACUTE SWINE ERYSIPELAS (3,062), CHRONIC SWINE ERYSIPELAS (21,811), *S. dublin* INFECTION in calves (625), BLACKLEG (26), RINGWORM in horses (210), COW POX (1,714), EQUINE INFLUENZA (1,478), EQUINE PUSTULAR STOMATITIS (602), BOVINE MALIGNANT CATARRH (74), "CROUP" in cattle (70), EQUINE CHORIOPTIC MANGE (8,709), BOVINE SARCOPTIC MANGE (409), PORCINE SARCOPTIC MANGE (3,266), EQUINE COITAL EXANTHEMA (189), EQUINE PURPURA (264). In addition 13,166 cases of DOG DISTEMPER and 1,183 of DEMODECTIC MANGE in dogs were reported.

Figures for the diagnosis service for fowl diseases are also given.

In the campaign against BOVINE TUBERCULOSIS 72 cases of TUBERCULOUS METRITIS and 169 of TUBERCULOUS MASTITIS were detected. Tuber-

culin testing was carried out in 194,265 herds (98.4% of all the herds). The disease was absent from 170,411 (87.7%) of the tested herds. Figures are also given for those positive in August 1945: these show that 99% of all herds had been tested and that 92% were free of the disease.

In the campaign against BOVINE BRUCELLOSIS, 13,038 samples of placenta and blood, 5,270 samples of blood alone and 3,260 of placenta alone were examined at the Serum Laboratory, Copenhagen, corresponding figures for positive results being 656, 790 and 2,857. Vaccine (type not stated) was given to 55,341 animals. 9% of 649,000 cattle newly blood tested gave positive results.

The livestock census included 609,191 horses, 3,187,921 cattle, 2,083,651 swine, 202,621 sheep and 16,835,775 fowls. Figures are also given about the import and export of livestock.

The numbers of animals slaughtered (those found to be tuberculous in brackets) are given as:—347,617 adult cattle (43,827), 251,410 fat calves (10,544), 383,509 new born calves (140), 104,393 sheep and goats (55), 16,820 horses (23) and 2,307,118 pigs (47,379). Milk control figures include results of quality tests, but no data on tuberculous infection.

As usual, nearly half the report consists of the texts of new laws and regulations enacted during the year.—J. E.

## BOOK REVIEWS

— (1946.) **The artificial insemination of farm animals.** [Edited by PERRY, E. J.] pp. 265. 47 figs. New Brunswick, N.J.: Rutgers University Press. 8vo. \$3.50. 1267

This book is the result of the collaboration of seven authors, each an authority on the particular subject with which he deals. Following a brief historical and anatomical introduction, the technique and apparatus required for the successful artificial insemination of cattle, horses, birds and swine are described in detail. A clear account is given of the factors which influence the rate of conception and the best procedures to adopt for the storage and transport of semen. The requirements for the establishment and financing of artificial breeding associations are also considered. An adequate description of the laws of Mendelian inheritance is included and systems of breeding and the more important points to consider when selecting sires for breeding better livestock are also discussed. Some short notes on disease problems and the feeding and management of sires complete the book.

Being essentially practical, this book will be of the greatest value to those directly concerned with artificial insemination and the handling of semen. It will also be read with great interest by all those who are connected with the breeding of farm animals and are interested in the possibilities and limitation of artificial insemination.—J. A. N.

PETERSEN, W. W. [Dr. Med. Veter. Overdyrlæge ved Statskontrollen (Frederikssund)]. (1941.) Soes og Smaagrisesnes Sygdomme. [**Diseases of sows and piglets.**] pp. 66. 17 figs. Copenhagen: De danske Andels- og Privatslagterier. 4to. 1268

This book, written by the chief veterinarian of a large abattoir for swine, is intended as a guide for farmers; it deals with the management of sows,

breeding diseases, farrowing and the diseases of young pigs.—H. C. BENDIXEN.

FISCHER, A. [Head of the Biological Institute, Carlsberg Foundation, Copenhagen]. (1946.) **Biology of tissue cells.** pp. viii + 348. 55 figs., 15 tables. Cambridge: University Press; New York: G. E. Stechert & Co.; Copenhagen: Gyldendalske Boghandel Nordisk Forlag. 8vo. 31s. 6d. 1269

Many biologists are aware of the fact that work on tissue culture has made rapid advances during the past half century, but tend to regard such work as specialized and have only a vague idea of the possibilities of the subject and its influence on other branches of science and on physiology in particular. The present work makes no pretence of being either a monograph or a general textbook on the subject, but comprises a collection of independent essays written around much of the author's published and hitherto unpublished researches in the field. DR. FISCHER's method has been to approach many fundamental problems of the physiology and biology of cells within the organism from the aspect of tissue culture. In spite of the rapid recent advances, the field is still very complex and the author makes it clear that some of his interpretations of experimental data may prove to be faulty in the light of newer knowledge. Nevertheless he suggests that such interpretations may be of value at this stage of the development of the subject by stimulating further research and investigations.

The essays are presented under the following titles: "Units of living matter", "Tissue cells in vivo and in vitro", "General morphology of tissue cells in vitro", "Special morphology of tissue cells in vitro", "Rate of growth", "Tissue culture as a whole", "Regeneration", "Differentiation and organization", "Interchanges of cells and medium (senescence and rejuvenescence)",

"The nature of growth-promoting substances", "Nitrogen metabolism of tissue cells", "Energy exchange of tissue cells cultivated in vitro", "Concluding remarks and perspectives". It will be seen that though each essay is an entity in itself, there is a connecting and developmental theme throughout. Each essay is well documented by references to original works and papers.

It should be appreciated that the original was written in Danish and that the present work is really a translation by a Dane. The exposition of the subject is clear and the style lucid; nevertheless it would have been an improvement if the final version had been proof-read by an English scientist to remove blemishes in the form of minor grammatical and spelling errors.

Readers interested in this specialized subject should find the work extremely useful, not only for its valuable exposition of the present state of knowledge but also for the thought-provoking and stimulating presentation by an author who is master of his subject.—A. EDEN.

DEWAR, T. [Ph.D., B.Pharm., B.Sc. (Lond.), Ph.C. of the Middle Temple, Barrister-at-Law, Examiner to the Pharmaceutical Society of Great Britain]. (1945.) **A textbook of forensic pharmacy.** pp. xvi + 253. London: Edward Arnold & Co. 8vo. 10s. 6d. 1270

This book includes all the forensic pharmacy ordinarily taught to those studying for the qualifying examination of the Pharmaceutical Society of Great Britain. The rules and regulations of the Society, the sale and supply of poisons by retail chemists and in hospital and rules about the manufacture, storage and transport of poisons are also dealt with. A number of chapters discussed. Dangerous drugs, *i.e.*, drugs of addiction, deal with the laws regulating the labelling, sale and advertising of drugs. The appendixes deal with the Poisons Rule, Dangerous Drugs Regulations, poisons which are the subject of monographs in the British Pharmacopoeia, etc. The author has assembled within this book material which will be of interest not only to the student, but also to all those who have to prescribe or dispense drugs.—J. M. ROBSON.

— (1945.) *Wesen und Bedeutung der Konstitution in der Tierzucht. [Constitution in animal breeding.]*—*Schr. schweiz. Ver. Tierz.* No. 7. pp. 75. Bern-Bümpliz: Verlag und Druck von Benteli AG. 8vo. Sw. Fr. 5.40. [French summaries.] 1271

See also *absts.* 1127 (treatise on medicinal and veterinary protozoology), 1204 (penicillin in veterinary medicine).

This consists of four papers read at a meeting of the Swiss Society for Animal Breeding. In an opening paper, PROFESSOR SCHMID emphasizes the importance of the subject from a practical point of view and need for removing as early as possible from any particular herd weaknesses in constitution and health. DR. RIEDER discusses to what extent the constitution of domestic animals is influenced by the conditions under which they are kept. He admits the significance of hereditary factors but emphasizes the importance of hygienic measures. DR. JUNG discusses critical phases in the life of animals, *i.e.*, their actual development, in which every cell division is critical, the period following birth, in which muscular and skeletal growth occurs, puberty and sexual maturity, and pregnancy. Certain dietetic factors are of special importance at these various phases of life. DR. ENGELER states that by using animals with a satisfactory hereditary basis, natural immunity against diseases can be developed. He has shown that intensive economic exploitation of the herds in Switzerland during the last 30 years has not decreased their longevity or fecundity.—J. M. R.

LAGERLÖF, N. (1943.) *Husdjurens vanligaste sjukdomar. [The most common diseases of domestic animals.]* pp. 291. 69 figs. Stockholm: Nördisk Rotogravyrs Handböcker för Jordbrukare. 8vo. Kr. 2.75. 1272

This elementary textbook on the commonest diseases of horses, cattle, swine and sheep has been written mainly for the farming community.

The work is divided into 12 sections dealing with infectious diseases, parasitic diseases, poisoning, deficiency diseases, diseases of the alimentary system, circulatory system, respiratory system, urinary system and reproductive system, the locomotor apparatus and the skin. The final section gives general advice on procedure in cases of disease.

The ground covered is wide for such a small book, but a fair balance seems to have been maintained. Thirty-five pages are devoted to sterility, bovine TB. has 18 pages, bovine brucellosis 15 pages and foot and mouth disease eight pages. Incidentally, these three diseases are very informatively described, together with particulars on the state control schemes. There are 69 photographs or figures, nearly all being very helpful. As a farmer's handbook the flimsy paper binding is not nearly strong enough, but the paper and the printing are good.—J. E.

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The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

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